The Builder.

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Selected Design for Birmingham Council House Extension.....Messrs. Ashley & Winton Newman, Architects.

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The XVIth-Century Fortress of Nicosia.

A DIALOGUE.—*The Author:* "As to the siege of Nicosia, a modern fortress, such an event would not have occurred but for the small number of the garrison. This is well known to many, and especially to you who have visited the place." *The Count:* "The fortress of Nicosia was seen by me two months before the Turk invested it, and everything about it seemed well considered. I observed that, although of earth, it was the finest work of the kind that could be made. I was still more astonished at hearing of its construction by the illustrious Sig. Giulio Savorgnano with the greatest ease within the short space of eight months."

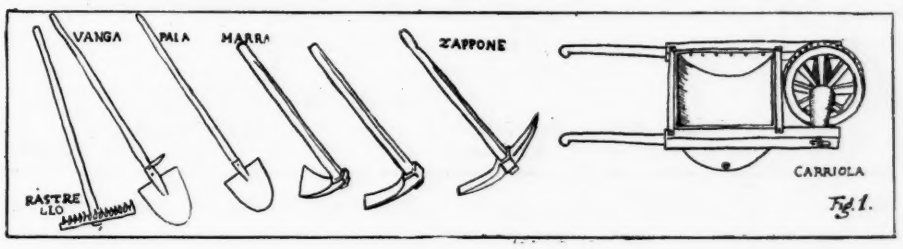


Fig. 1.

THE above is from "Le Fortificatione," a folio published by Bonainto Lorini, a Florentine engineer in the service of the Venetian Republic at Venice in 1609. This book is illustrated with numerous plans of fortifications, all precisely on the same principle as the circular fortress of Nicosia—the apparently unique example of this principle surviving at the present day. Amongst Lorini's old woodcuts are also some curious designs for machinery, tools, etc., used by the engineers of the XVIth century in constructing such earthworks. (Fig. 1.)

Nicosia is probably unique as a town or city three miles in circuit, enclosed within regularly planned earthwork of so long ago as the middle of the XVIth century, still untouched by the modifying developments of a later system. In Europe we have plenty of old cities surrounded with their mediæval walls, but it would be difficult to find another example of the early Italian circular fortress. The science of military engineering was revolutionised by Sebastian Vauban at the end of the XVIIth century, and to that period we owe the obliteration not only of innumerable mediæval town walls, but also of all the preceding designs in earthwork.

The castles and châteaux of the Middle Ages and the Renaissance were often designed with almost as much artistic feeling as the cathedrals, but in the XVIIIth century such architectural details as gateways, bridges, or barracks were lost amongst the huge mounds of earth which constituted the approaches of a modern European city, and at the present day the term "military architecture" is obsolete.

Fortresses built before the close of the XVIIth century were primarily designed for the warlike purpose in view—such a fact goes without saying—but at the same time they were designed as architectural monuments, and they often were intended by their proportions and details to convey an impression of power and grandeur which is very appropriate under the circumstances. Many of the citadels of Italy, such, for instance, as that of Aquila, built in 1530, have been designed with all that Italian facility for adapting the object in view to an artistic expression. At Aquila the design of the delicate marble entrance, enriched with warlike trophies, approached by a picturesque drawbridge, in the midst of the immense flanking bastions nearly 100 ft. high, their sinister-looking embrasures turned on the visitor uncannily, suggests luxury combined with power. The remains of the great fortifications of Verona, designed by Michael Sammicheli, have been described by Gwilt as wonderful "in the mode in which Sammicheli combined pure and beautiful architecture with the requisites called for in fortification." But the grand architectural fortress is a thing of the past, of centuries ago, and even the traces of the few which still remain in Europe are naturally becoming less distinct as they are modified by modern needs, or are built around or upon by buildings, or planted as boulevards.

Viollet-le-Duc, in his "Histoire d'une Forteresse" (Paris, 1880), has created almost a romance out of a subject which is usually considered one of the most abstruse and uninviting studies in the world. He has shown the vast amount of interest which may be aroused by the vicissitudes of an ancient stronghold where generations have maintained

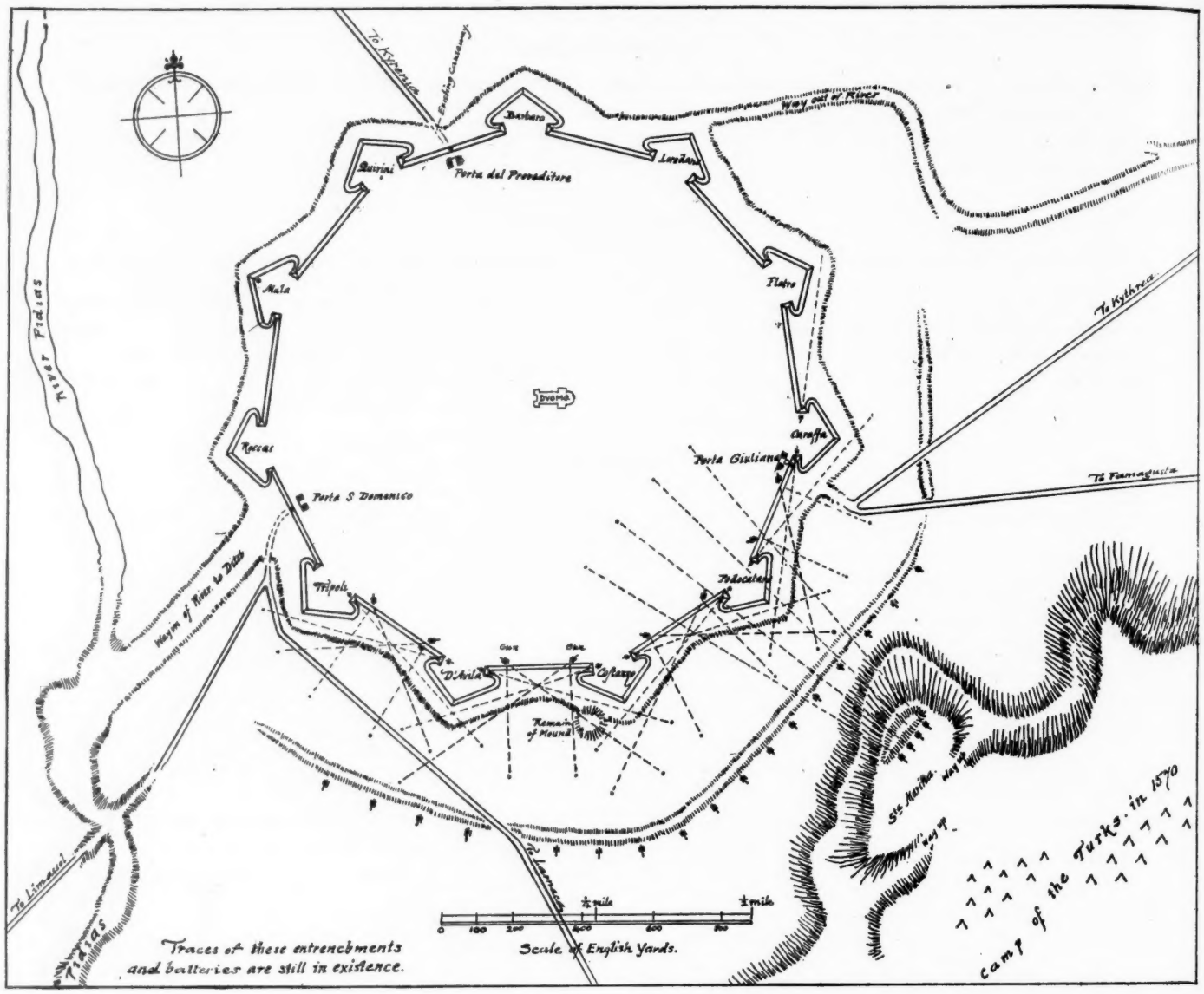


Diagram of the Siege of Nicosia in 1570.

their supremacy or contending races have struggled to obtain an ascendancy. Viollet-le-Duc lays but little stress on the purely architectural character of his imaginary fortress of La Roche-Pont, and he even carries the interest of the reader on into the days of the last Franco-German war, when he supposes the place to have been reduced to a mere strategic point in a plan of campaign. In his enthusiasm as an archæologist, and also as a student of the ingenious constructions for defence and offence of past ages, he rather oddly omits any references to the artistic character which manifests itself in the older systems of fortifications, and of which he has himself given plenty of illustrations in the famous "Dictionnaire."

The beautiful châteaux of France, with their façades in the style of Francis I., whereon the sculptured effigies of Mars and Bellona, or the knights of the round table, once bid defiance to the enemy, are paralleled by the great fortresses of the Venetian Republic, with their gateways guarded by the lion of S. Mark offering peace to all the world—at least to all the world which submitted to S. Mark's rule. Perhaps if Viollet-le-Duc had ever visited these great monuments of Venetian enterprise on the shores of the Adriatic, or in the Levantine lands, he would have been able to write a still more stirring architectural romance inspired by such a complete vision of the past as Nauplia or Famagusta.

Within the sphere of British dominion very few ancient fortresses designed to resist artillery exist; in the British Islands there is absolutely nothing important of the kind before the building of the Martello towers to prevent Napoléon's invasion of the Kentish shore. A few block-houses in the West Indies, and some fortifications in Canada and India, may be of the same period or a little older. In Cyprus, however, by a strange course of political events, the British Government has become possessed of two old Italian fortresses enclosing cities of the first class. Nicosia may be described as an original design of the "Cinquecento" (XVIth century); Famagusta is of an altogether older and more mediæval type.

As already remarked, the fortress of Nicosia is probably the only surviving example of a circular fortification designed on a principle which seems to have been popular at the close of the XVIth century. The popularity is evidenced by the number of designs of the kind which still exist, and by the books written on the system by Lorini and Maggi, and by many other curious old worm-eaten folios of the period.

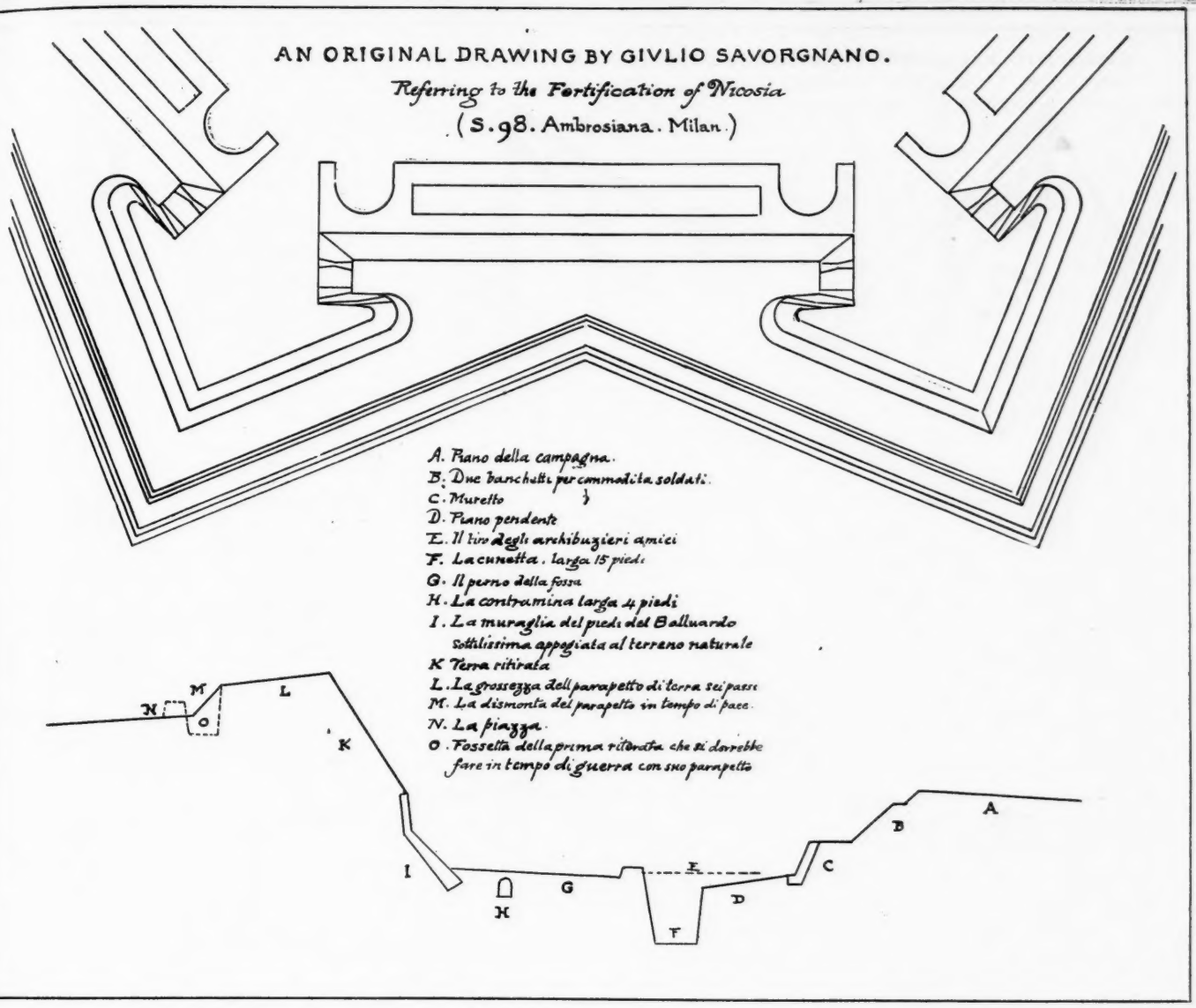
Giulio Savorgnano, the designer of the fortress of Nicosia, seems to have lived at Pieve d'Asopo, an obscure town in the Venetian territory. Cigogna, the Venetian antiquary, has recorded a curious epitaph formerly in the church of Pieve, in which Savorgnano's name is mentioned under the date of 1586. He was sent out to the Levant in the capacity of General in the army and Governor of a fortress. His first administration was at Zara, in Dalmatia, whence he was removed to Cyprus and appointed Governor of Nicosia—the Proveditore or Viceroy of the Island Government at the time being Francesco Barbaro. Savorgnano probably occupied the post of a Lieutenant-Colonel of Royal Engineers of modern times, and designed the fortress as well as governed it.

In Cyprus Savorgnano found the capital of the island a venerable city of the Middle Ages, surrounded by the usual irregular walls and towers. The space enclosed was probably largely occupied by gardens in the way of many old Italian cities—the crumbling fortifications were, of course, useless for withstanding the approaching Turkish siege. Early in 1567 Savorgnano set about the work of putting the city into a state of defence—it being the unanimous wish of the Cypriotes to constitute Nicosia the chief fortress of the country. As events turned out it would have been better if they had taken refuge in Famagusta. Savorgnano seems to have been well seconded by the Proveditore Barbaro and by the Cypriote and Italian nobility, eleven of whose family names were attached to the

AN ORIGINAL DRAWING BY GIVLIO SAVORGNANO.

Referring to the Fortification of Nicosia

(S. 98. Ambrosiana. Milan.)


A. Piano della campagna.
B. Due banchetti per commodita soldati.
C. Muretto
D. Piano pendente
E. Il tiro degli archibuzieri amici
F. La cunetta. larga 15 piedi
G. Il perno della fossa
H. La contramina larga 4 piedi
I. La muraglia del piedi del Balluardo
Sottilissima appogiata al terreno naturale
K Terra ritirata
L. La grossezza dell parapetto di terra sei passi
M. La dismonta del parapetto in tempo di pace.
N. La piazza.
O. Fossetta della prima ritirata che si darebbe
fare in tempo di guerra con suo parapetto

eleven bastions of the new fortification (see plan of siege) as a recognition of the assistance given in the work. At the commencement of his operations the new Governor of the city sent in a report on the proposed alterations to the walls to the Venetian Senate. This has been published in collections of documents relating to the war of 1570-71 in Reinhard's "Geschichte der K. Cypern."

The mediæval walls of the city having been pulled down, Savorgnano proceeded to set out the new work as an exact circle with the cathedral of S. Sofia as the centre. For this purpose he was probably able to avail himself of an upper story to the towers of the church—a story which seems to have been destroyed at the siege. From this high level of about 100 ft. he probably set out the circle of one Italian mile in diameter with the instrument described at the end of Lorini's "Fortificatione"—a set square on a revolving table secured with the usual screws to any angle horizontal or vertical. Lorini's illustration of its use on a tower sufficiently explains the very simple method of the period. (Fig. 2.) Lorini also illustrates the setting out of the angles of bastions, etc.; and his old woodcuts, although very imperfect, give a graphic idea of the means employed in transporting the earth and building materials within the scarped wall of the fortress, the wall having, of course, to be built first of all, and the ditch gradually formed as the earth was heaped up inside. At the present day a very similar swing derrick to that represented by Lorini is in use for unloading ships at the quays of Constantinople. (See drawings of "Strumenti.")

The letters written by Giulo Savorgnano, preserved in the Ambrosiana Library, Milan, give some idea of the construction of the fortress of Nicosia. One of these is dated Venice, August 4, 1584; the name of the person to whom it is addressed unfortunately does not appear. Evidently it was written as a professional opinion offered to some personage engaged in the religious wars of North-Western Europe raging at that time. A reference to the Prince of Parma, the General of the Land Forces prepared to invade England under the wing of the famous Spanish Armada in July, 1588, suggests the idea that a request had been made for plans for a fortress in connexion with one of the Prince's proposed campaigns—could it have been the invasion of England? The great breach with Spain took place in January, 1584, and the preparations for the invasion of England were commenced long before the actual attempt was made in 1588. The following letter is accompanied by a plan and a section which presumably are copied from Savorgnano's drawings for Nicosia. The MS. is literally translated from the old Italian, and the drawings traced.

"I send you a plan for two bastions to scale, as you wish to build a fortress with seven bastions, the which would not be very large, nor yet considered a very small one. In such fortifications I have always taken the greatest care not to incur such heavy expenses that the Prince is unable to see the end of infinite cost in the thickness of the walling as well as for the 'spurs' as well

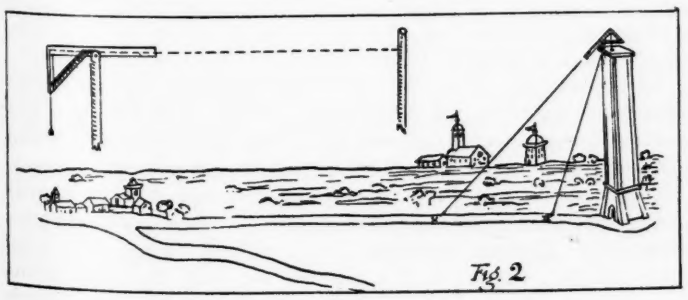


Fig. 2

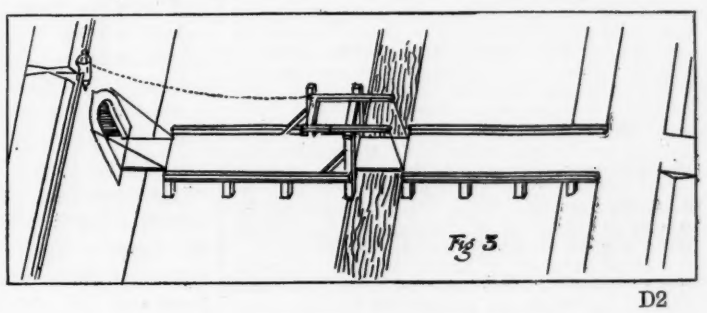
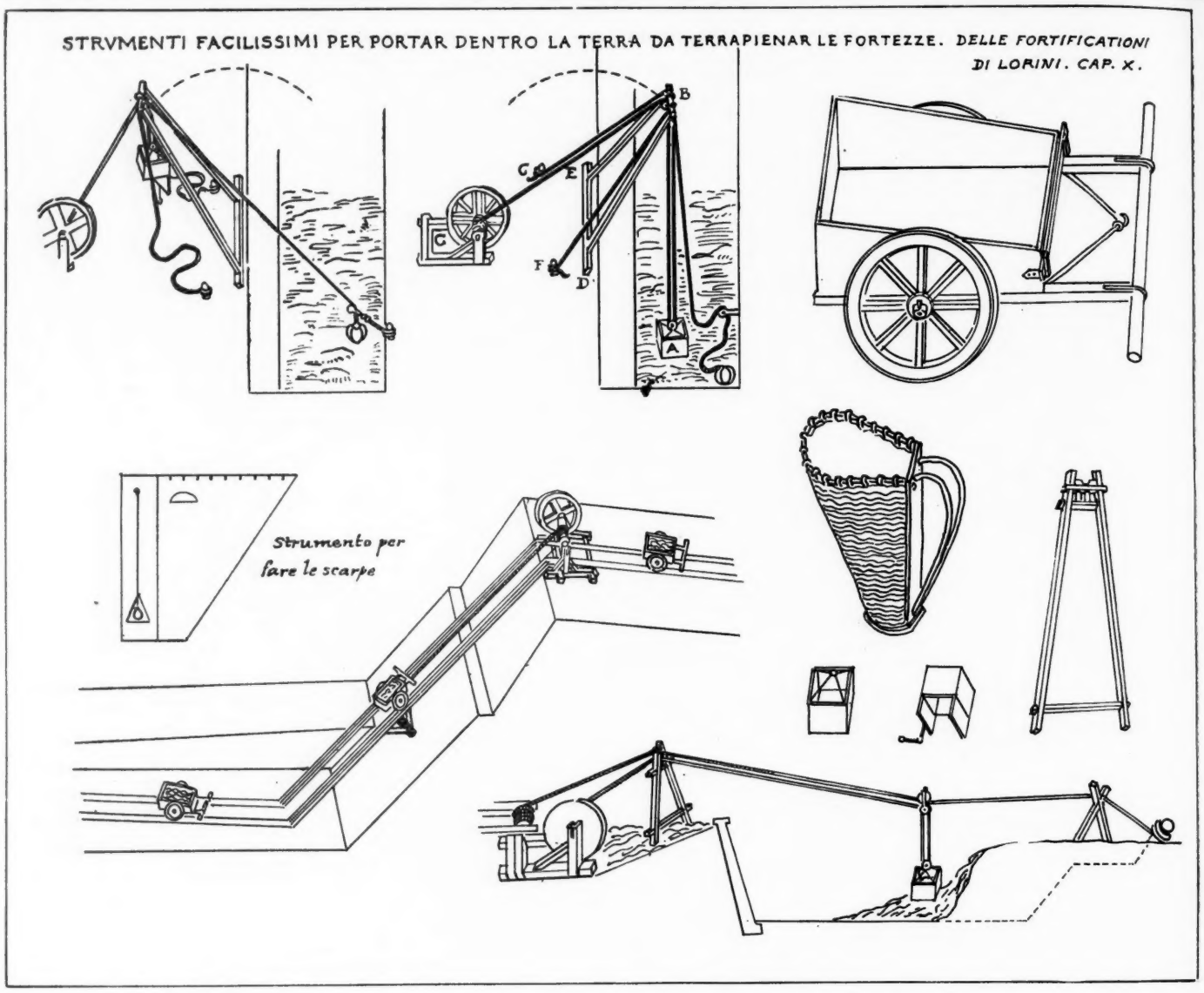


Fig 3



Various Mechanical Means Employed in Constructing a Fortress of the XVIth Century.

downwards as upwards from the 'cordone,' also in vaultings and parapets of masonry, which have such a much better appearance than earthworks in the eyes of those who do not understand. Earthworks with sloping faces commencing at the surrounding ground level, and downwards into the fosse, with retaining walls or shoes of two sorts [*i.e.*, two angles ?] with a fosse of 4 ft. or 5 ft. [piedi] in depth. I have made to the number of about fifty both curtains and bastions. I have always made them with the thinnest possible walling, without 'spurs' ['speroni,' by this term is apparently meant the contreforts or buttresses on the inside of the walling], and without any masonry from the level of the surrounding country upwards, as I have said, in order not to receive any battering. And the reason I have thought to do this is because the Turks could not with many thousands of cannon-balls cause a single cartload of earth to fall into the fosse at Nicosia. Such a plan results in great saving to the Prince, who can even save ninety per cent., besides time and trouble."

Then follows a long description of the fosse with its countermines and exits, and of the cunetta, or lower ditch.

"On all my bastions I make a single platform, which may be considered a saving of one-third of the expense.

"Gun carriage stands on the 'orécchioni' (ears of the bastion), for firing 'in barba' or down the face of the bastions, are most safe provided you know the right distance to make them from the 'orécchioni.' With this form of bastion one can always make use of twelve pieces of artillery, three at each embrasure, constructing two embrasures at each 'orécchione'; so that whilst four cannon are being fired the other eight are being loaded.

"All my flanks I make thirty paces [thick ?], the two embrasures next the curtain are ten paces [wide ?], and the shoes of the inclined earthwork are ten paces. The thickness of the parapets allows of a counter-fosse in which there is space for several ranks of soldiers.

"It is necessary to attend in time to check these 'maladetti' traverses and mounds of earth such as the Turks are accustomed to throw into the fosse, and which it is impossible to clear away as quickly as they are formed. And, finally, it is necessary the supplies of bread, powder, and soldiers should be sufficient to replace the killed and the exhausted, and that the captains should be intelligent (as well as valorous), to know how to make timely repairs, retreats, to keep the open spaces clear, and so, with a good site, one can keep the affair going for a long time. In the present war in Flanders under His Excellency General the Prince of Parma, with so many well-paid men, it is reasonable to expect the presence of a great many captains showing extra capability. Recommending myself to your Lordship. From Venice, August 4, 1584.—Obediently your servant,

"GIULIO SAVORGNANO."

Another MS. letter by Savorgnano in the same collection at Milan contains the following:—

"The merlins between the embrasures should always be made of earth and not of masonry, for if they are of masonry the Turks easily destroy them. At Nicosia, for instance, when they were of earth they were not destroyed after thousands of cannon shots had been directed against them. Such merlins must be of bricks, not burnt, but dried in the sun, of clay mixed with chopped straw, and in time of peace they can be protected from the effects of rain and frost by being covered over with a very thin walling of masonry or burnt brick to be removed in war time, and then the merlin must be re-covered with carefully tempered clay."

Comparing the drawings and letters of Savorgnano with the actual appearance of the fortress at the present day, it is evident that some amount of modification has taken place in its design since the XVIth century. No trace remains of the elaborate arrangements of the fosse except the causeway, which still survives to some extent outside the Kyrenia Gate (Porta del Proveditore). This causeway or bridge across the moat exactly resembles the drawing of Lorini from a similar position. (Fig. 3.) But the greatest alteration made by the Turks was the substitution of a sheathing of masonry to the entire surface of the curtain wall and the bastions, thus doing away with the principle of pure earthwork construction so much insisted upon by Savorgnano. The fortification designed in 1567 seems not to have been really completed in time to withstand the siege, although Lorini states that eight months sufficed for the purpose. After the Turks had captured the city they doubtless had many breaches to repair, especially on the south side, and in so doing they appear to have added a stone face to the upper scarp, following the traditional mode of constructing fortresses in Syria and elsewhere in the Levant. The immense masonry scarps of Aleppo or Jerusalem citadels, which date from a little earlier in the XVIth century, suggest this idea. The Turks had no great desire for fortifications; they were the pioneers of our modern warfare in the open—they never even fortified Constantinople for the use of artillery.

The architectural character of ancient fortifications, which has already been referred to, make itself felt in the case of Nicosia in the finely-cut masonry of the escarpments and in the elegantly designed gates. These architectural details have already been illustrated in the *Builder* for July 21, 1900. Since that article of six years ago was written

considerable deterioration in this curious monument has taken place.

This sketch of the fortress of Nicosia would be incomplete without some reference to its use and its armament. The fortress was applied to the use for which it was built before it was finished, and the story of its siege by the Turks in 1570 (July 22, to its capture by assault and general butchery of the unfortunate inhabitants on September 9) has been told by many writers, several of whom were amongst the few survivors carried off as slaves to Constantinople. The first account in English was a translation of the official statement of Paolo Paruta, Historiographer to the Venetian Republic, published by Henry Carey, Duke of Monmouth, in 1658. Mr. C. Delaval Cobham, C.M.G., Commissioner of Larnaca, has also made during the last few years a collection of translations

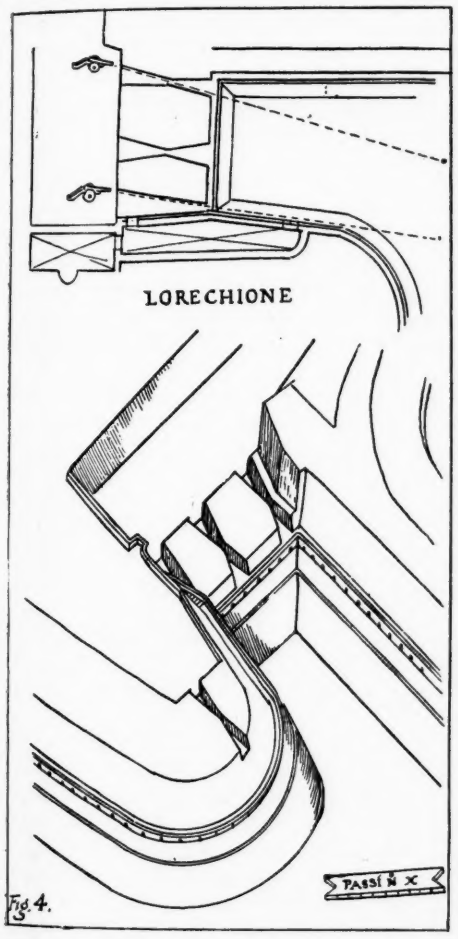


Fig. 4.

from old Italian books and MSS. published under the title "Excerpta Cypria" (Larnaca, 1896-1902).

According to Paruta the fortress was well furnished with artillery and warlike stores, and had a garrison of about 10,000 men. A general conception of the arrangement of the armament of the bastions may be obtained by referring to the drawings of Lorini's book, reproduced in Fig. 4. At Nicosia there are traces of gun-platforms on the curtain at a point shown on the plan of the siege at about one-quarter of the length of each curtain from its extremities. These platforms may, however, be of any subsequent date. The armament of the fortress has completely disappeared; carried off, apparently, to Constantinople at the time of the British occupation of Cyprus. Two much-corroded cannon which serve as gate-posts at the Kyrenia Gate may perhaps be the sole survivors of the period.

Nicosia was lost by the incapacity of the commandant, who, amongst other foolish things, allowed the Turks to gain possession, on their first arrival before the city, of the heights which command it from the south, and also to profit by the presence of ruins and the ditch of the former city for their approaches and batteries. These approaches and the remains of the earthworks were still very much *en évidence* at the time the accompanying plan of the siege was made in 1899. The suburb is now becoming built over, and these traces must ere long disappear. On this side the Turks made their entrance chiefly by means of filling up the ditch with earth, gabions, etc., and the last stand of the Italians on the fatal September 9 was on the "Barbaro" bastion on the opposite side of the city. Traces of the mound of earth by which the Turks gained access are still in existence, as shown on the plan of the siege.

NOTES.

The Latest Earthquake.

THE serious earthquake reported this week from Jamaica was followed by the outbreak of fires, which, as in the cases of San Francisco and Valparaiso, caused far greater destruction than the earth movements themselves. The past history of Kingston is an object-lesson showing how slowly the lessons of experience are assimilated so far as concerns precaution against fire. Founded as the result of the great earthquake that destroyed Port Royal in 1692, and acquiring increased importance owing to the destruction of the same town by fire in 1703, Kingston suffered severely from fires during the XVIIIth and XIXth centuries In 1780 a large part of the city was consumed, in 1843 an extensive fire was responsible for wide-spread damage, in 1862 the commercial district was virtually destroyed, and in 1882 nearly 600 houses were burned and 6,000 people rendered homeless. None of these occurrences seem to have suggested the advisability of departure from traditional methods of building construction, but we hope that the obvious lesson will be taken to heart after the visitation that has once more overtaken this unfortunate city.

Trades Disputes.

IN our articles on the Trades Disputes Act when it was passing through its various stages as a Bill we drew attention to the fact that the trade unions were already availing themselves of the powers they possessed to bring political influence to bear on their members. This question was raised in a concrete form at the meetings of the Miners' Federation and the Railway Servants' Congress, when the subject of debate was whether the trade unions were unquestioningly to accept the policy put forward by the Labour Socialistic party in Parliament (*see* our article October 20 last). Since the passing of the Act it is apparent that the trade unions will be able to avail themselves of the provisions of that Act for political purposes, and this question is already exercising the minds of certain members of unions who are not Socialists. The Lancashire and Cheshire Conservative Working Men's Federation has already raised the point by issuing a circular drawing attention to the injustice effected by the unions in making the levy for Parliamentary purposes compulsory as part of the contribution to the union funds, and urging that the fund for Parliamentary purposes should be kept distinct from the funds which are used for the ordinary purposes of the unions, viz., sick pay, strike pay, superannuation, etc. Whatever may be thought of the powers of compulsion exercised by the unions—powers now confirmed and extended by Act of Parliament—it is obvious that they should not be used for the political purposes of any party whatever, as such a policy is not only unfair to the individual, but will have a most disastrous effect on the trade of the country. We much regretted that this point was not more regarded when the Bill was before Parliament, but we venture to think, if the present political policy of the unions is extended, that in the interest of all parties the Legislature will have to intervene. Labour questions pure and simple unfortunately give rise to very strong feeling on the part of those concerned, but if the political opinions of the parties are also to be involved in labour disputes it is impossible to foretell what may be the eventual outcome.*

The Labour Party and Municipalities.

THE manifesto issued by the Metropolitan District Council of the Independent Labour Party, a summary of which appeared in the *Times* last week, contains no demands that the public are not already accustomed to as emanating from that source, but in view of the approaching County Council elections it is desirable that familiarity with the principles thus promulgated should not breed apathetic contempt. The aim of the Labour Party is to convert the London County Council into a socialistic monopoly with both administrative and trading functions. The trade unions have found by experience that the municipalities are to be encouraged as employers of labour, as pressure can be brought to bear upon them, not only by the ordinary means at the disposal of the unions, but also at the polls. The manifesto proposes that the London County Council should be the port and dock authority, should supply electricity in bulk, coals and milk, and should have power to own the tubes, local railways, and the motor-omnibuses. The Council is to be given rating powers to rate unoccupied land, which is denominated "unearned increment," with compulsory powers to acquire land for housing purposes outside the metropolis. We venture to submit that recent events have made it abundantly clear that administrative functions and trading functions should in no case be combined in the same body. Local self-government was originally inaugurated to give the authorities administrative

* Since the above Note was written the Courts have refused to grant an injunction to restrain the unions from making a compulsory levy for Parliamentary purposes.

functions, which were to be exercised for the protection of the public by the inspection of houses, drains, etc., and the examination of certain commodities. What value will attach to these functions when the owners of houses or the vendors of commodities are the inspecting body?

Labour Returns. THE Labour Returns for December state that the building trade remains in about the same condition that it was a year ago. This is very disappointing, considering the period of activity which has marked the past year in connexion with nearly all other trades. There are still symptoms of improvement in other trades, and the rise of wages during the month amounted to 8,400*l.* per week; the percentage of unemployed is, however, ow the same as at the corresponding period last year. Twenty new trade disputes commenced in December as compared with fifteen in December, 1905, but the number of workpeople affected is only 1,034 more than those affected at that time. The year 1906 has shown an increase in trade disputes, and the number of workpeople affected was above the average for the previous ten years.

"America's Amazing Advance." IN a pamphlet under this title Mr. Richard H. Edmonds gives a glowing account of the agricultural and industrial developments that have taken place in the United States within the last quarter of a century. The writer takes the view, for which we recognise there is some reasonable support, that the progress so far made has been largely of preparatory character. He also expresses the opinion, which of course is merely prospective, that the results obtained will be doubled or quadrupled during the next twenty-five years. However that may be, the figures quoted certainly suggest a most striking picture of American prosperity. Since 1880 the aggregate annual value of industrial products has increased from 1,080 millions to 3,400 millions, and even during the last six years the total increase has been from 2,600 millions to 3,400 millions. The statement that "the scarcity of labourers is the universal cry" we believe to be quite correct, and should be glad to hear it in this country.

Non-Provided School Buildings in London. WE recently made some comments on the appeal of the Bishops of London and Southwark for a sum of 50,000*l.* in order to bring a number of the non-provided school buildings in London up to a proper standard. The Archbishop of Westminster now asks for 100,000*l.* "to improve or replace our existing schools in such a way as to meet all the requirements of the local authorities." It is obvious from this startling demand that the Roman Catholic elementary schools of London are, as regards structure and sanitation, far below the proper standard. Whatever other result the recent educational controversy may have produced, it has at any rate done something to show the need for bringing non-provided school buildings in London up to a proper standard. But this demand by the Archbishop of Westminster again raises the question, how is it that these buildings have been allowed to deteriorate as they have done? What is the use of Government inspection or local responsibility?

Forestry in New South Wales. AS IN other countries, the necessity for the conservation of forestry has been recognised in New South Wales, where the State reserves cover a total area of about 7½ million acres. In addition there are tracts representing in all nearly 7 million acres from which timber for general purposes may be cut under conditions sufficiently stringent to discourage needless waste and to provide for the future. In the official Year-Book of New South Wales there will be found a useful category of the chief varieties of timber grown in the State. Of these, ironbarks constitute a small but important class, being unsurpassed in respect of strength and durability. The eucalyptus family is represented by pale and red hardwoods, among the former being tallow-wood, a favourite for building construction owing to its non-flammability, and among the latter Murray red gum, noted for resistance to decay and the attack of insects and sea-worms. Turpentine is another wood possessing special value in resisting the attack of worms and the action of fire. The Year-Book also contains particulars relative to several other classes, including about two dozen varieties of timber, and indicates the uses for which they are most suitable. Owing to the rapid growing and reproductive properties of the eucalyptus, replanting on an extensive scale is unnecessary in their case, but ordinary varieties of timber will require aid if depletion is to be avoided in the future. Therefore it is satisfactory to learn that the Forestry Department have already established a large central nursery where some 50,000 plants per annum are reared and distributed for the maintenance of the public forests.

A New Road from London into Essex. THE Leyton District and Hackney Borough Councils are taking steps for the construction of a new road which will cross the Hackney, or waterworks, Cut of the River Lea by a bridge at Hackney. The two authorities have agreed to make their respective lengths of the road to and from the bridge, and it is hoped that the London County Council will contribute to the undertaking by defraying the cost, computed at 6,000*l.*, of the new bridge. The road would greatly facilitate the means of communication between the north-east parts of London and the south-western districts of Essex. The existing three routes consist of the Mile End-road, which, after crossing the Lea and the Pudding Mill River at Bow, turns northwards through Stratford and, skirting West Ham, continues to Leyton; Lea Bridge-road from Upper Clapton, which crosses the Hackney Cut and the Lea near the East London filter-beds, and traverses Leyton Marsh; and the intermediate road from Homerton High-street, which crosses the Hackney Cut at Marsh Bridge and, traversing Hackney Marshes, is carried over the Lead, or Temple Mill, stream of the Lea at Temple Mills, where toll is paid to the owners of the road. The northern and southern routes, whose directions we describe, afford but circuitous means of access from London through Hackney to Leyton, and so, by the high road through Chigwell and Chipping Ongar, to Chelmsford and Colchester. Roman and Old Ford roads lead from Bethnal Green to Old Ford, where they end at a spot close to the junction of Hackney Cut and the Lea and the main sewer northern outlet.

The Menai Suspension Bridge. NO DOUBT the Carnarvonshire County Council were wise in declining to accept the offer of Mr. Lewis Harcourt to hand over the Menai suspension bridge as a "free gift" from the Government. Under its present ownership the structure provides for local traffic just as well as it would if the transfer were effected, the only difference being that the responsibility for maintenance and possibly for reconstruction would also be transferred. It was suggested during the discussion of the proposal that the insecure state of the bridge might necessitate its replacement, or at any rate a very serious outlay on repairs in a short time. We think it by no means improbable that the condition of the structure is not so bad as represented by speakers whose main object was to influence the minds of the Council. At the same time, it is only reasonable to suppose that after nearly eighty-five years' service the bridge may need to be thoroughly overhauled. As the first example of a suspension bridge built on an extensive scale, this famous work of Telford is of special interest to engineers. It was a bold idea to connect the two sides of a strait, 1,700 ft. wide, by a roadway suspended 102 ft. above high-water level, with two intermediate supports 580 ft. apart. The Government must feel sorry that their generosity was not appreciated, because now they will have to undertake any repairs that may be found necessary to the bridge.

New Incandescent Lamps. THE paper by Mr. Swinburne on "New Incandescent Lamps," read to the Institution of Electrical Engineers last week, excited great interest, and the meeting was exceptionally crowded. Electricians were anxious to hear the opinion of one whose knowledge of the practical difficulties in the way of manufacturing good incandescent lamps is probably unrivalled, on the development of the metallic filament lamp. The lecturer admitted the great advance that had been made, but he pointed out that of small candle-power lamps only those for 100-volt circuits had so far been produced. For 200-volt circuits, however, metallic filament lamps of high candle-power could be made, and probably there would be a demand for them. The consumers would thus get more light, but their meter bills would not be appreciably reduced. He suggested that the average consumer cared little about the amount of his electric lighting bill as long as the light was thoroughly satisfactory. This suggestion must have amused the station engineers present who supply small consumers. An objection brought forward to the use of the new lamps was the dazzling effect of the filament. This could be prevented

by using a ground-glass bulb, but this would cut off a certain fraction of the light generated, and thus diminish the value of the lamp. Mr. Swinburne discussed the possible metals that might be used for lamp filaments, and quoted some new results obtained at the National Physical Laboratory for the melting points of the refractory metals. It appears that carbon and boron cannot really be said to melt at all. They turn from solid into gas without going through any intermediate liquid state. In the discussion Professor Kapp pointed out that not only had osmium and tantalum lamps an efficiency more than double that of carbon lamps, but they were also much less affected by the usual fluctuations in the pressure of the supply. He also showed how modern theories, notably that proposed by Guillaume, explained the high efficiencies of the metal filaments. Many new types of lamp were shown after the meeting, but we only noticed one running on a 200-volt circuit.

The Organ, St. Albans Cathedral.

A BRIEF news paragraph appeared in our columns a fortnight ago, stating how Lord Aldenham had offered to defray the cost of repairing the organ at St. Albans Cathedral, and of removing it from over the choir screen, for division into two portions and re-erection in arches on the north and south sides of the screen. The repairing is all right, but as to the proposed removal, we can only say that it is a most ill-advised proceeding and a very foolish expenditure of money, whether in a musical or an architectural sense. The Editor of this journal speaks from some special knowledge of organs and organ-playing in saying that there is no position so favourable for the effect of a cathedral organ as the position on the screen, with free space to sound all round; and there is nothing worse you can do with an organ than to divide it and cut it up into sections to put in arches on each side of the building. The unity and concentration of the instrument are entirely lost by such an arrangement. In an architectural sense, also, the old position of the organ on the screen is the best; it makes a fine central object in the vista, and gives a little more mystery to the interior by partially interrupting the perspective. The idea of the "uninterrupted vista" which is to be obtained by removing the organ from the central position, has by no means the advantage sometimes supposed to be attached to it; it destroys the opportunity for erecting a grand and monumental organ-case design; and the effect upon the organ itself is ruinous.

The Landscape Exhibition.

THE catalogue of this year's exhibition of the Six Landscape painters (Society of Water-Colours Gallery) has for its motto the following sentence by Millet—"Every artist ought to have a central thought, a *pensée mère*, which he expresses with all the strength of his soul, and tries to stamp on the hearts of others." It is right to look on the works exhibited in the light of this motto, and recognise that the aim of the painters is to give, not a mere representation of landscape, but the central feeling with which it impresses the artist. Mr. Peppercorn's contributions would hardly be justifiable in any other light; and even as it is, several of his works are too heavy and loaded and too far removed from nature to affect us much. The one entitled "The Cliff" is a fine bold work. The trees in "The Timber Waggon" we cannot consent to recognise as trees, nor can we accept the rough scrawls of paint in "A Devonshire Stream" as representing clouds. The prevailing defect in this roomful of landscapes, with a few exceptions, is a want of daylight effect and an overpowering heaviness in the sky. The first one of Mr. Austen Brown's, "After the Harvest," is an exception; that is a real sky; and so is Mr. Aumonier's "A French Byway"; and among his we like two of the smaller ones, "The Gate of the Common" and "Wenden, Essex"; the large picture, "The River Piave," looks very bare and bald, but this may be the impression of the actual scene. Mr. Allan's "Northerly Breeze" is nearest to his best way, which is hardly represented in any of the pictures here. Mr. Leslie Thomson, in "Blakeney," paints in a fine solid manner an expanse of undulated grass land making a high horizon against the sky, against which a distant church and windmill stand out; this, though what one might call prosaic in treatment, is one of the most successful things in the room. "The Landing Place" is an admirable bit of composition, and "A Dorset River" is a fine broadly-lighted work, though the clouds in the horizon look rather too solid to keep their place in the scene. Mr. Hill is the one of the six who is most determined against letting us have air and sunlight; his large work, "A Wooded Vale," is a fine composition, but very sombre, as is the small view of "Cromer"—very like the place in its general lines, but why make Cromer so gloomy? It is possible to be poetic in landscape without losing sight of what Constable called "God's daylight."

Mr. Harry Goodwin's Exhibition.

AT the New Dudley Gallery, Piccadilly, there is on view a collection of seventy landscapes by Mr. Harry Goodwin, mostly water-colours, with a few oil pictures. The subjects include "Swiss Mountains and English Coast Scenery." Among them are some very beautiful water-colours. We may mention especially "Sunset Wings, Old Boston" (1), a study of a special effect of evening sky; "Spring in the Meadows, Les Avants" (25); "Babbacombe Bay, Devon" (19), which represents admirably the character of the summer coast landscape of this part of Devonshire, with the almost Mediterranean blue of the sea; "Morning at Cowdray, Midhurst" (33); "Sea Sculpture, Torquay" (35); with a foreground of rocks curiously moulded by wind and sea; "On the Simplon" (42); and "Solitude" (10), a large and fine study of moonlight effect on lake and hills. In the drawing of "Monte Rosa from Milan Cathedral" (9), in which the roof of the cathedral, with its statues and flying buttresses, forms the main portion of the picture, the effect is rather spoiled by the hard treatment of the architecture, more like what may be called architectural draughtsman's work than that of a painter. Sometimes, as we have taken occasion to notice, painters go to the other extreme, and sacrifice all the detail of a building in order to reduce it to a mere "effect," which is a mistake. But too hard a precision sacrifices pictorial effect. There is much, however, among these drawings worth a visit—as far as they can be seen under the very unsatisfactory light of the New Dudley Gallery.

Modern Society of Portrait Painters.

WE should have thought the "Society of Portrait Painters," established only a few years ago, was modern enough, but it seems to have occurred to some younger painters, chiefly residents of Chelsea apparently, that something still more "modern" was wanted to represent their art; hence the exhibition now open at the Royal Institute Galleries in Piccadilly. Judging from the result, the object would seem to be to show how it is possible to paint a number of portraits, no doubt more or less accurate likenesses, which shall be destitute of any artistic charm or any pictorial quality. In this respect the exhibition is sadly successful; we have never seen a collection of portraits from which it was so difficult to extract any enjoyment; while some of them, such as the portraits of men, Nos. 14 and 16, are almost revolting in their vulgarity of style. Among the exceptions which are not without attractions of colour and composition may be mentioned Mr. Ivan Lindhe's "Absorbed" (1), a well composed and graceful half-length; Mr. Gregg's "The Picture Book" and "Miss Ida Ross" (23, 24); Mr. Sholto Douglas's three portraits of ladies (26 to 28), in which however the faces are very wooden in effect; Mr. Priest's "Two Portraits" (46), those of a man and a magpie; Mr. Maxwell Balfour's "Lord Milner" (60); Mr. Crealock's "Madame Solenne" (89), in a red dress relieved against a blank ground of neutral tint—an effective work; and Mr. David Neave's carefully finished cabinet portraits of ladies and furniture (113 to 116), which are good and conscientious work, somewhat in the manner of Mr. F. D. Millet. But as a whole we do not think the Society justifies its existence or the amount of wall space it occupies.

Water-colours by Miss Nixon.

AT the Society of Fine Arts is a collection of water-colours of "Algeria and the Low Countries" (rather an odd mixture) by Miss Mima Nixon. The Low Countries set are for the most part very much the best, though the artist does not treat architecture well in the cases in which, as in No. 17, it becomes an important part of the picture; she is better in smaller combinations, as in "Notre Dame, Bruges" (11), a canal, the distant church, and a group of prim-looking trees. The showy Dutch flower parterres are charming in colour, as is also the one of "Daffodils" (29), with the thin trees bending in the March wind in the background. Among others may be specially mentioned "Reflections — Dordrecht" (51) and "Evening, Volendam" (56); the last-named an admirable composition of real pictorial character.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary fortnightly meeting of the Architectural Association was held on Friday last week at Tufton-street, Westminster, S.W., Mr. Walter Cave, Vice-President, in the chair.

The minutes and nominations having been read and confirmed, and Mr. E. L. Hunot having been elected a member of the Association, it was announced that Mr. T. T. G. Donaldson Selby had been reinstated as a member.

The President.

The Chairman said he had to report that the President, Mr. R. S. Balfour, was progressing fairly satisfactorily. He had left the nursing home, and although he had had a slight set-back last week he (the speaker) thought that that was due to nervousness. He had seen Mr. Balfour's cousin, who said that the President was looking better even than he was before his illness, and he was going on as well as could be expected.

It was announced that Mr. Francis R. Taylor had been awarded a prize of three guineas in connexion with the Architectural Association photographic competition.

The Arrangement and Design of Modern Churches.

The Chairman then called upon Mr. Temple Moore to read a paper on "The Arrangement and Design of Modern Churches." Mr. Moore said:—

"In selecting this subject for my paper I am afraid there is little that I can say that has not already been said by others; still, though I do not hope to be able to tell you anything very fresh, I trust that some points I touch upon may prove of some use to our students.

In speaking of the arrangement and design of the modern English church I am assuming that such a building is in the Gothic manner, for whatever may be the merits of revived modern British classic, which appears for the present to hold the field so far as civil architecture is concerned, I trust that we are not likely to return to more or less skilfully-applied arrangements of the five orders for our ecclesiastical buildings.

For one reason, whatever may be the case with our civil buildings, the strictest economy is in most instances a necessity in the ordinary course of modern church building, consistent with a substantial structure, and I believe that well-understood Gothic may be so handled that a good architectural effect can be produced in the most simple way without having to depend on applied architectural ornaments.

Of course, I do not mean to say that the style in which a building may be designed has anything to do with its suitability or convenience, which is entirely a matter of planning and general arrangement; but, on the other hand, one often hears it asserted that such and such a style is quite unsuited to modern requirements, as if the sections of the base moulds or the door and window jambs could in any way affect the convenience or suitability of the building. It is no doubt true that the ordinary modern church possesses, as a rule, very little of either beauty or interest, and is also often far from satisfactory in general arrangement. I think that the cause of this has often been that the designers of these buildings have had little first-hand knowledge of the proper treatment of their subject, and possibly have taken little interest or pains in the matter, so that it is not fair to lay these failures at the door of the style, nor to suppose that had all the caps been Corinthian or Doric the buildings in question would have been one whit better than they are.

The common type of modern church, with a nave divided into comparatively narrow bays with low lean-to aisles, a clearstory with a very high-pitched main open roof, a chancel generally lower than the nave, and divided from it by a heavy chancel arch, with the end of one aisle filled up by a vestry, and the other by an organ-chamber, on either side of the chancel, is probably as unsuitable a type as could have been selected for a large congregation. It has been repeated over and over again during the last forty years, and, though one now frequently sees departures from it in the better modern work, it is still a type far too prevalent.

How such a plan came to be so general I cannot say. I suppose it has a certain element of cheapness, and somehow got recognised as the correct thing for a church. It is curious that the elder Pugin, who was practically the pioneer in revived Gothic, generally avoided this defective plan, and it is interesting to cite his churches at Birmingham and Derby, as well as St. George's, Southwark, as excellent examples of planning suitable to modern requirements.

For the purpose of discussing the arrangement of a modern church, let us take the average size of a building suitable to a modern town parish, a building capable of accommodating, say, 600 to 900 people.

Some people think that a mistake has been made in multiplying comparatively small parishes, and that it would have been better policy to have built larger churches to serve more extensive areas. Though, doubtless, such a system would have some advantages we have to consider things as they are. Taking, then, a church of the above average size as a standard, the first question that should be always considered in laying down the plan is the site.

As a general rule the sites available in the suburbs of modern English towns have not much to recommend them in the way of picturesqueness; but, however dull they may be, there is usually some peculiarity which should influence the design of the building to be placed upon them.

One of the greatest faults in modern work is that this question of the site is not nearly so carefully considered as it should be. This is certainly the case in a great deal of modern church building, and is also true, to a certain extent, in other branches of modern architecture, buildings looking when they are finished as if they had nothing to do with the place they happen to be in.

Generally the plan of such a church as I am speaking of will probably resolve itself into a nave with aisles on either side; and I consider that this is often the best plan to be adopted; but it is important to remember that, in a church where practically the whole of the space, excepting the choir, is to be occupied by the congregation, it is well to make the aisles and the arches separating them from the central nave as wide and spacious as possible. This makes the building, as much as can be, a single whole internally, and will not make it like two or three buildings placed side by side. It is also important to carry the aisles eastward, beyond the commencement of the chancel, to at least within one bay of the east end, as this practically opens the whole of the choir to the nave and aisles.

A plan on these lines looks, of course, very square on paper; but this is by no means a defect from a practical point of view, as the congregation are more together than in a long and narrow building.

I mentioned that I consider that the bays of the arcades should be kept fairly wide, and I think that the advantage of this is that a few large pillars do not cut up the interior of the building in the same degree as a greater number of smaller ones do.

You must remember that in most old churches where the aisles are divided from the central nave by, comparatively speaking, narrow bays, the aisles were little used for a general congregation, which was principally accommodated in the central part.

It is, of course, impossible, as a rule, under present conditions, to lavish space in this way, when, for reasons of economy, every foot has to be considered.

In the English church the surpliced choir, though often much abused, has practically become a fixed institution, and, this being so, it is of the greatest importance that proper and ample space should be provided for it. This, unfortunately—generally, I suppose, from motives of economy—is rarely done in a sufficient manner, and churches are disfigured by filling the choir with rows of what are really nothing but pews placed lengthwise, and with quite an insufficient central space between the front desks. There should be not more than two rows of stalls on either side of the chancel, and the longer the rows are the better the effect.

With regard to the sanctuary, here again it is of the utmost importance to provide ample space, especially in length, as without this no dignity of effect can be obtained. Steps should be kept low and broad, and arranged as far as possible in groups, so as to give wide platforms in front of the altar and between the Communion rail and the stalls.

A few years ago it was the fashion to very much exaggerate the elevation of the choir and altar, and latterly the tendency has been rather to the other extreme.

I think myself that for a church such as we are considering an elevation of seven or eight steps from the nave up to the altar would be quite sufficient.

The organ is another important consideration; the modern instrument, as a rule, has become so large that it is often a great difficulty to provide for it. It is fatal to the internal effect of the building to block up the end of one of the choir aisles with the organ. Probably a chamber projecting from the aisles is, generally speaking, the best plan, but it is essential that there should be plenty of height and that the front should be as open as possible.

Sometimes it is possible to arrange for the organ over the vestries, and, where this is practicable, it is probably as good a plan as any.

The rules laid down by the Ecclesiastical Commissioners and the Incorporated Church Building Society are, of course, useful as a guide for the spacing of seats, widths of passages, etc. These rules lay down quite the minimum space which should be allowed for these purposes, and, in my opinion, rather more space should, where possible, be allowed.

With regard to towers and spires, these are probably, in most cases, better omitted in a town church, unless there is some prospect of enough money to build them of sufficient size without stinting the rest of the building. The poor little spire which one sometimes sees, with its top not very much higher than a neighbouring warehouse or gin palace, is not an object worth spending money on.

As to the position of the tower, the centre of the west end is, no doubt, generally speaking, the right place; but frequently the exigencies of the site, especially in a town, render a departure from this very good general rule desirable.

Regarding doorways, you must remember that most urban by-laws have now stringent regulations which affect the design of these features, and in most cases make a departure from the traditional treatment absolutely necessary.

To return for a moment to the question of a general plan. You must not suppose that I think a central nave with side aisles is the only right arrangement; this is a point that should, to a great extent, be governed by the nature of the site.

Where there happens to be a long and narrow site probably a single plan, with comparatively narrow side aisles or passage-ways, is the best solution; but it must be remembered that a building of this type requires considerable height to the wall-plate in proportion to the clear width if a good internal effect is to be obtained. A proportion something after the manner of a covered railway-station is certain to be unsatisfactory.

Another very simple and practical plan which might be much more frequently adopted than it is, especially where economy has to be considered, is a nave and chancel of fair width, with an aisle on one side only, of about the same width and height. The XVIIth century church of St. John's, Leeds, is a good example (though wanting in internal height) of how well a church of this type may look.

There are, however, many ways by which a more or less difficult or irregular site may be successfully covered, while keeping in view the necessity for a spacious and open interior. Many suggestive examples of planning of this type may be found in the old towns of Germany and Belgium, as well as in France, where the churches have had to be fitted on to confined sites.

In this country our old churches generally stand surrounded by churchyards, and the type of treatment I am speaking of is therefore comparatively rare here.

The beautiful and interesting old church of St. Crux, York, barbarously pulled down some twenty-five years ago, was, however, if I remember rightly, a good example of it.

This question of planning is one that hardly

too much care and attention can be given to if a satisfactory result is to be expected. However simple the plan may be the success or otherwise of the building depends upon it, quite as much from the æsthetic point of view as from the practical.

Far too little attention is, in my opinion, given by students and others to the study of the plans of our old churches. One is far too apt to be content with making pretty little sketches of details and parts and neglecting the main dimensions of an old building.

Having settled the main lines of the general plan, the next question is the section, and this, again, is a matter that is largely governed by the question of cost. Generally speaking, the higher, in reason, the wall-plate can be the finer will be the effect internally.

I do not think myself that much internal effect is gained by a very high-pitched open roof, which is also likely to have practical disadvantages, both acoustically and for purposes of warming and ventilation. The real proportion of the building is practically settled by the height of the walls, though the proportion may be completed, so to speak, by the total height to the highest point of the internal ceiling, which may be of barrel or other form. Of course, there is no internal roof for a Gothic building equal to a stone or brick groined vault; but this is a very expensive method, and I am rather confining myself at present to what may be done in ordinary cases.

Where only a moderate height to the wall-plate is possible, it is, I think, better not to attempt a clearstory, but to carry the nave arcades up to the full height. If the aisle, or aisles, are of about the same width as the nave they can be similarly roofed; and the aisle walls, in this case being the same height as the nave, the side windows can be kept well up, so as to thoroughly light the interior.

This is a style of church very common, as you know, in the west country, though, as a rule, they are too low in their proportion. There are, however, some exceptions, such as the church at Dartmouth, which is a very good example of this class. This section of church is also common in Germany, where it is often seen carried out on a grand scale with vaulted roofs.

Where your plan is arranged for narrower aisles than the type I have been describing, these may be roofed with flat or lean-to roofs; but in this latter case it will be generally found advisable to increase the height of the nave wall-plate, as otherwise the aisle walls will be too low to allow of sufficient elevation being given to the windows, the result being that the interior will be badly lighted. This is a defect in this particular type which has to be guarded against.

Where, however, you can get a height of 25 ft. to 30 ft. to the aisle wall-plate, and about 35 ft. to the nave wall-plate, the difficulty I have mentioned will not occur, and you will have sufficient height in the nave to have a really stately arcade.

Of course, the lighting from a clearstory which is at all well designed is always very fine; but it should be remembered that, the building being intended to be used altogether, the effect of the interior should be a spacious whole; this effect will be lost if the arcades are robbed for the sake of the clearstory, and the aisles thus become, as it were, subsidiary buildings to the nave. This is a perfectly right and proper treatment in certain cases, but not one to be aimed at in a building that should, I consider, be designed to be used as a whole.

I think, as a rule, it is better in a modern church, such as I am speaking of, to omit the chancel arch altogether, and to carry the building at one height through from end to end, because the large piers of the chancel arch tend to obstruct the view from the aisles into the choir, though there are cases where a building has to be carried out in sections where the structural division between the nave and choir may be highly desirable. Of course, this feature is the general rule in our ancient parish churches, though there are plenty of exceptions to it, such as St. Peter's, Mancroft, Norwich, and many others. It is also to be remembered, as regards the chancel arch, that its upper part was very often practically entirely covered by the great rood loft and rood, with the space behind the rood filled in with boarding, on which was generally a painting of the Last Judgment.

This, no doubt, would have a very fine architectural effect, but it is one that is rarely possible under modern conditions.

Where a chancel arch is introduced I feel myself that the choir wants to be of very considerable length, the ordinary modern custom of making it equal in length to two bays of the nave, and separated from the latter by an arch, never, to my mind, can give a satisfactory architectural result, and only unnecessarily cuts up and confuses the interior. If you look at the plan of almost any old English parish church you will nearly always be struck by the great length of the eastern limb, and this is an essential feature to the good architectural effect of what is with us the more common type of a mediæval church.

This, however, is not the type which I think is the most suitable to our present requirements, and is shorn of its beauty of proportion when the eastern limb is, in the usual modern way, cut down to about half its proper length.

As to windows, the question is rather a difficult one in the present day, when, usually, it is not easy to get them filled with good stained glass.

The most part of modern stained-glass work is certainly not worth providing extra large windows for, and it is seldom that one sees large windows filled in a really satisfactory manner, even by the best modern glass.

On the other hand, it is a great mistake to under-window a building, as a gloomy interior in this climate is generally very unattractive and depressing.

The great point, I think, is to keep the side windows as high up as possible in the walls, and this, of course, is the advantage of a clearstory; but, where the clearstory is lacking, a fine effect may be obtained by the proper arrangement of the west windows. The effect of the light coming in from a good height in the west wall has often as good a result as that from the clearstory.

The arrangement of the east window, or windows, is a matter which may be so much varied according to the general design of the building that it is hardly possible to lay down any general rule on the subject. The large east window traditional to English Gothic work is a splendid thing when well designed, but it is certainly not satisfactory without its stained glass. This is rarely now put in when a church is built, with the result that the effect possibly of a really well-designed window can often hardly be seen on account of the glare through the white glass.

On the other hand, the east wall, which is, of course, the most conspicuous internal feature of the church, requires a good deal of breaking up, and I think that a grouping of windows with large piers between them would often give a better result than one very large window, especially where the stained glass has to be left to the future.

The proportion and detail of the piers and arches is another matter of the greatest importance. More may be done by fine ample proportions and good simple mouldings than by a quantity of carving and ornament, and, in this case, as well as with other features of the building, careful and continual study of our good ancient examples is, I believe, absolutely essential if satisfactorily designed modern work is to be produced. You cannot expect to be able to make up a successful Gothic building from plates in some particular book on ecclesiastical architecture; valuable as many of these are the old examples must be studied first hand.

A chapel with a second altar is a very usual feature in modern churches, and, where properly managed, adds much to the interest of the interior. It is generally placed on one side of the choir, as a sort of pendant to the vestry and organ-chamber; but I do not consider that this always is the best or only position possible.

Where there is sufficient length in the site the chapel might very well be placed to the east of the end of the choir; this would have the advantage of adding to the apparent length of the building, and the effect of the high altar is always more dignified if it is not placed immediately against the end wall of the church.

The chapel, or chapels, should, however, properly speaking, be always enclosed with suitable screen work.

We have so far been considering the plan and sections of a building mainly as affecting the interior.

With regard to the exterior, I think it will generally be found that where the plan and sections have been carefully thought out, the external elevations will come into shape without any great difficulty. I am certain that it is a mistake, generally speaking, to start with some fixed notion as to the external appearance and then try to fit the interior to it.

A building in the Gothic manner should, if it is to be successful, be designed from the inside outwards, and here I may point out that such very usual features as buttresses in a Gothic church are, properly speaking, part of the construction, and should not be introduced merely for the sake of dividing up the wall spaces and making the drawings look a little more busy and interesting.

Well-designed buttresses, where they are required structurally, are, of course, one of the finest features of Gothic work; but they must not be used as the pilasters in a classic front, merely as ornament.

I think it well to remind you of this very obvious distinction as one frequently hears the remark made in criticising a set of plans, would not such and such a wall be improved by being "broken up" by some buttresses, quite irrespective of the structural necessity or otherwise of these features?

A good outline is of far greater importance to a building externally than any amount of ornamental detail, and it is a frequent fault with modern work that it is often overloaded with trivial detail, which, though it may make a set of drawings look more attractive, has only a harmful result when carried out in actual work. A good, well-proportioned building may very possibly be greatly improved by well-designed and suitable detail and enrichment, but no amount of either of these latter will conceal a bad design. Many people do not realise the fact that a building is never seen in the way that it is shown on architectural elevations and sections, and with the view of making these latter look attractive features are often put in that the actual building would be better without. Good Gothic does not consist in the endless multiplication of cusps and pateræ or monograms, charming as these ornaments may be when judiciously used.

A great deal also depends on the proper use of materials. A good design may easily be reduced to a very dull level in actual work if the modern method of having every stone exactly the same colour and size, and every brick the same colour and so on, is followed. It is extraordinary how difficult it often is to get workmen, and others, to understand this, and I suppose it will take years to eradicate the traditions of Portland cement stucco.

It has often seemed to me that the apparent ideal of modern stone work is to try to make it look as like as possible to the Portland or Roman cement imitations of stone of forty or fifty years ago. This also applies to other trades; for instance, it is most difficult to find men who know how to carry out Gothic oak work properly. They cannot forbear the use of sand-paper and glue unless they are most carefully watched.

Having dealt so far with the general structure of the building I will say a few words in conclusion as to its internal fittings and furniture. These, of course, are of great importance to the successful completion.

Unfortunately, it often happens that gifts are made of fittings and furniture, of metal, woodwork, etc., bought ready-made from the ecclesiastical furniture shops, and these things, as a rule, are of the very worst and poorest description, both in design and artistic workmanship. It is not, however, fair to overlook the fact that furniture and accessories, which have been specially designed, are often little better so far as their architectural character is concerned than the ready-made article; and this is no doubt due to the lack of proper knowledge of old work on the part of those who have designed them. No opportunity should be missed of carefully studying any of the fittings of an old church that still

remain. Unfortunately, so much has been destroyed in this country that this class of work is comparatively scarce. Still, however, there is a good deal left, and it is always, I think, advisable to take careful note of the more simple examples, especially as these are far more likely to be useful under the generally straitened conditions which influence the fitting-up of a modern church. Much modern work so obviously looks as if it had been founded on some old design of a very much more sumptuous character, and had been thinned and skinned down to meet the available price. It is usual enough, for instance, to see modern stall work and such like covered with tracery and carving, and done in the thinnest possible wood.

Work of this character cannot look well, while a quite satisfactory effect could have been got by reducing the amount of detail to a minimum and keeping the material to the proper size. Even in old work it is by no means the rule that the most elaborate designs are the best—the reverse of this is very frequently the case.

These remarks as to woodwork may, to some extent, also apply to metal work. There has been the same tendency to disguise ill-designed form with a superfluity of detail. Latterly one has noticed a certain reaction against this, where practically the detail is left out altogether, without, however, obtaining a particularly successful result.

Enumerating briefly the most important fittings of the interior of the church, taking first the altar, it is important that it should be of ample size and properly proportioned, and that it should not, speaking generally, be overshadowed by its ornaments and surroundings.

I think myself that the reredos, for instance, is a feature that is often very greatly overdone. Splendid as our old wall reredoses are, even they, I consider, rather tend to overpower the altar they were intended to adorn, and this defect is even more pronounced in some modern work. The triptych of the late Flemish or German Gothic type, charming as they are in their own surroundings, are, as a rule, not a very suitable type of altar-piece for our English churches, their proportions being generally too tall for our buildings. As there is practically very little work of this class left in this country, even in a mutilated state, it is necessary often to look abroad for our models. I think more suitable types of altar-pieces for our buildings are to be found in France, or among examples of Italian Gothic, though these latter especially require to be entirely translated in their detail for our purposes. The eastern light should, I think, always be visible from the body of the church below the traceried heads of the bays of the chancel screen.

The plan of omitting the east window altogether and filling the whole end of the church with the reredos is not to be recommended, except, of course, where there are practical difficulties with regard to light. I need hardly say that whether the reredos is of wood or stone it should be as a general rule richly guilt and coloured. Of course, the altar-piece may be entirely treated with hangings, and where this is properly done probably there is no more suitable or dignified treatment. An exaggerated dossal, however, with its narrow tester, looking rather like a portion of a very big bed, is to my mind to be avoided, and a superfluity of upholstery is undesirable.

Where the chancel can be of considerable length there is no doubt that a high rood screen is the greatest possible ornament to the interior, but I think it requires very considerable depth behind it to give it its true value. It is curious, however, the prejudice one frequently meets against a screen. It is certainly not the case that a properly designed oak rood screen of the type suitable to a parish church obstructs any necessary view, though many people seem to think so. This is sometimes avoided by the use of iron, but I do not think that iron screen work ever looks quite satisfactory with our English work, and certainly the modern examples one sees are rarely successful.

The font should stand in the nave, preferably in the centre near to the western doors. As a rule the font is not now generally given at all a sufficiently prominent position. It should always have a cover, however simple, and this latter feature may be, as you know, very beautifully treated.

The pulpit is another important piece of furniture, which should be carefully designed, and I think that as a rule wood is preferable to stone. It requires carefully proportioning as to height in accordance with the size of the building, and may often with advantage have a sounding board or canopy.

The front of the organ (it is hardly correct now to speak of an organ case where the instrument is frequently as big as a cottage) facing the church, or chancel, can be made to look very well if skilfully treated.

There are unfortunately no Gothic examples left in England (there is but one in Wales), though there are some very good XVIIth century ones. The illustrations in Hill's book on the organ give a number of Gothic examples from abroad, many of which are most suggestive.

The introduction of electric light has made the treatment of this very important modern requirement much easier than in the days of gas, one of the chief advantages being that a great deal of dirt will be avoided, and may make possible a more frequent use of coloured wall decoration; and if this could take the form of simple figure subjects, painted in distemper on the walls, such as one finds traces of in almost every old church, I believe it would add greatly to the interest of the interior, judiciously introduced and designed and executed on the right lines.

I think I have now kept you long enough wandering in and about this imaginary church. My old friend and master, the late George Gilbert Scott, used to say that it was of the utmost importance that you should walk about a building before you drew it, and, taken with a careful study of ancient examples, I do not think this advice can be much improved on."

Mr. G. H. Fellowes-Prynne, in proposing a vote of thanks to the lecturer, said that there were few men better able to speak on the subject than Mr. Temple Moore. He agreed with nearly everything that Mr. Moore had said, and his first proposition, or suggestion, he most warmly agreed with, *i.e.*, that proportion in a church was one of the first points to be considered, and not detail so much. In these days, when one was nearly always compelled to design churches with very limited means, it was a great pity that money was frittered away in the way it so often is in rather poor detail. Take carving. When one got carvers to come in and do certain work far too much was done on purely commercial lines; it was not the same thing as when the old carvers were called in, as the spirit of the work was generally not there, and we could seldom get that spirit which we longed to get. In designing a church the one idea should be to get thoroughly good proportion and aim at getting good proportion rather than inferior or elaborate detail. Then another very terse remark in the paper was as to designing a church from inside. It must be remembered that after all, picturesque as our churches were in the exterior—and that was almost always so in ancient work—yet the use of the church was internal, and the more effect one could get internally the better. If there was a little money to spare spend it on the interior as far as possible was his advice. As Mr. Temple Moore knew, church architects were not always able to carry out their own wishes exactly in their work. The lecturer spoke about chapels being enclosed in screens, and he knew the difficulty of getting that done. In one diocese a screen could be put up, but in another diocese it could not be done. In one diocese he was asked to take down the chancel gates and put up a screen round the chapel, and the inconsistencies of chancellors often occasioned architects a good deal of trouble. Another difficulty was the unsatisfactory state of the law, or chancellor-made law, as to different parts of our churches. As to the choir, he did not quite agree with Mr. Temple Moore that two rows only should be provided. He warmly agreed as to the length of the chancel, and as to getting all the length and dignity possible in the chancel; but three rows were very useful if the chancel were wide enough, say 30 ft. or even 27 ft. Three rows were better musically, he was told by musicians; the arrangement worked musically better. In narrow chancels they saw the reason for two rows; as broad a space as possible was required between the front rows; but in a church of large area three rows were desirable. Once more he would say, as he had often said, that he wished the younger men would do as architects had done in the past, he hoped, *i.e.*, try and study ancient work as a whole—treating a church as a whole and not in detail. It was fascinating to sketch poppy-heads and carved features, and so forth, and it was very useful; but if they had time it was better to get the proportions of a church and see what relations the columns bear to the arch and the nave vaults to the chancel, and above all to thoroughly study the place; it was more useful in designing. As regarded the reredos, he agreed that if anything was ill-designed one generally had to look at the reredos, for it was most often the feature in a church which was most ill-designed. It was far better, if one could do it, to design some sort of a baldachino—dossals, or some overhanging treatment. That was the most simple and dignified treatment. There was so much in the paper that he agreed with that there seemed little to add.

Mr. Francis Hooper, in seconding the vote of thanks, said he had not only had great pleasure in listening to Mr. Temple Moore's charming little paper, but in seeing the author of that very interesting little church at Lake, in the Isle of Wight. He thought he was right in saying that in that church the nave and the aisle were of the same width, with a series of shafts and an arcade in the centre which might, to those who had not seen the building, be regarded as an obstruction, but which, as treated by Mr. Temple Moore, produced a charming effect, which was to be found in at least one church in this country of mediæval times. There was much of interest in the paper which appeared to be incontrovertible, but there were, perhaps, one or two points which were open to slightly varying views. Mr. Temple Moore said that the omission of the east window seemed to be undesirable, and in another part of the paper he insisted on the importance of keeping the windows high up. That was an important matter, and one which might either make or mar a design. If they thought of the number of churches they had been in and of the number of east-ends which seemed to be completely spoilt because the east window, and the reredos could not be seen owing to the glare of light, they would realise that. As to whether the east window might be omitted altogether, that was a matter worth serious consideration, and whether the required light might be obtained in the south wall. Mr. Temple Moore also referred to the importance of the rood screen where the chancel joined the nave if there was no chancel arch—that it seemed undesirable to place such a screen where the chancel was short. He (the speaker) was under the impression that the addition of a screen tended, apparently, to lengthen the chancel, and he would like to know whether others took the same view. It was not always that the screen was erected with the building, and in very many cases it was an after addition, and in his opinion it tended to enhance the effect of length, and therefore might be desirable where the chancel was already short. He hoped that Mr. Temple Moore would be able to read another paper before the Association on some future occasion.

Mr. Leonard Williams, in supporting the vote of thanks, said he had been interested in the remarks as to buttresses being put in the wrong positions in modern buildings, but he thought that they were often a necessity seeing that one had churches of 9-in. brick walls. These walls needed something to keep them up; and if buttresses were incorporated in the thickness of the wall the effect would be much better and the church better built. As to windows being high up, he thought that Mr. Temple Moore's imaginary church would be almost more suitable to a town, generally speaking, than to the country. There were many

examples he had noticed; particularly in Warwickshire, where the aisle windows were very low down indeed, and when one stood up one could see the trees and fields and so on. There was abundance of light, and the whole aspect of the church was particularly cheerful. It had become the fashion to raise the windows unnecessarily high and, perhaps, keeping them rather too small, so as to get the light of the sky directly into the building; but the vast majority of village churches had the windows fairly low, and especially the east window. He quite agreed with Mr. Temple Moore that there was too much money lavished on rubbishy detail, particularly in Bath stone and the like material. If church piers were constructed of some interesting hard stone, simple in shape, and the arches just splayed brick, coated with plaster, that would be better than the moulded Bath stone one gets in the modern church. The demand nowadays was for cheap churches, and there was rarely sufficient money to spend on elaborate Gothic detail. Very cheap churches indeed, mostly built of brick, were often of lofty proportions with mean-looking lancet windows. Perhaps the general proportions would be considered by some people to be dignified, but from his point of view they were to be avoided. Something of lower proportions, with simple and suitable material ought to be provided, with substantial oak ceilings—instead of the wretched pitch-pine ceilings—simple nave, arcading, and plaster arches. This would give a better result, he thought. Modern stained glass was, he thought, better avoided as a rule. The effect in the churches in Warwickshire, where there was very little stained glass, was much more interesting and much more to be desired, especially where the plain glazing was of nice character. Excellent plain glass could be obtained now, and there were good glaziers who could put the windows together in a very good way—altogether different as compared with a few years ago, when tinted cathedral glass was very much in vogue. They could get some very good glass now in imitation of old Dutch glass which produced very much more satisfactory effects than a great deal of the stained glass one saw. As to the omission of the chancel arch, that also was most desirable, especially where the cheap church was to be constructed, and there was no reason why the usual division of the screen and something of a simple character should not be provided in place of the chancel arch. He had noticed one or two examples by Mr. Bodley where it had been done with excellent effect. As to the iron screen, he agreed that judging from the few he had seen, although some of them had been done by men said to be very eminent, they were most undesirable—so very different in effect from the Spanish screens to be seen abroad. They were generally hard and uninteresting and with a sham sort of cusping and heavy screws and nails; and they were very unbecoming in a church.

Mr. J. E. Newberry, in supporting the vote of thanks, said, as to old work, while he was a great admirer of old work, he thought it would almost be a good thing to study some of the best modern work in church work, and, as far as one could, to carry on the traditions, or rather the work, of some of our best modern men—such work as Sedding's, Bodley's, and Pearson's.

Mr. Walter Millard said it was a great treat to get such a paper, from an expert on the subject of churches—one who took the building as a whole and looked at it all round and inside it and through it, so to speak, and treated it as a unit. That was the way to look at any building really, —especially a church—to deal with the anatomy of it, reckoning the detail as trimming. It ought to be plain to anyone that that was the way to treat a building, but for all that it was well to have the matter put as it had been in the paper. He was particularly struck with the remark that far too little attention was given by students to the study of the plans of our old churches. It was so rarely that the plan was taken hold of seriously, and yet that was the point which mattered. Of course, with the plan went the section; they should be inseparable, and he was very pleased that Mr. Temple Moore laid such emphasis on that. Then, again, they could not, as the author said, expect to do successful work merely by studying plates in books. If books were used for the purpose of comparison—comparing one example with another—that was quite another way of using them. The author was so right, again, in his remarks as to designing a building from the inside outwards, and also in what he said about buttresses. One knew of good old examples which were all that one could desire, in which there were no buttresses showing at all on the outside. The buttress grew from the inside if it was to be any good; it represented a thrust, as a rule.

The Chairman, in putting the vote of thanks to the meeting, said that what would strike most people was that Mr. Temple Moore treated the subject in a way which they could all understand. He (the speaker) followed in his mind the building of the church Mr. Temple Moore dealt with.

The vote of thanks having been heartily agreed to,

Mr. Temple Moore, in reply, said that as to one point raised by Mr. Williams, he was speaking entirely of a town church, and that was the reason why he advised putting windows high up. There were obvious reasons for that. Mr. Williams referred to 9-in. walls in churches, but Mr. Fellowes-Prynne, who was one of his (the speaker's) fellow-workers in connexion with the Incorporated Church Building Society, would agree that we had not got to that yet, though he dared say it would come. As to the screen and the height of the east window, he was inclined to think that where they had a screen in a church they wanted to see the eastern light below it. He did not care for the effect of seeing a little hole above the top of the screen. Where they had a church with a screen they must get over the difficulty of the glare by the use of stained glass, but he thought that the screen of the tracery type—he was not speaking of the cathedral solid screen, but the tracery screen which one is accustomed to see in this country—needed a window behind it, so that light could be seen through it; this also had the advantage that, if the stained glass were not very nice, the effect produced might still be agreeable.

The Chairman announced that the next meeting will be held on January 25, when a paper will be read by Mr. R. Clipston Sturgis on "American and European School Architecture."

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE sixth meeting of the Discussion Section of the Association was held at No. 18, Tufton-street, Westminster, on the 9th inst., when a paper was read by Mr. Noel D. Sheffield on "Wall-papers."

Wall-papers in long strips as now in use, he said, were not manufactured till the end of the XVIIIth century, although it was probable they were used at a much earlier date by the Chinese. Previous to that date they were printed on small squares and were difficult to hang. A little work by Jackson, of Battersea, printed in 1744, gives some information on the use of wall-papers of that period, in which are illustrated copies of his designs mostly taken from Italian pictures and sculpture. William Morris was the first to arouse the public from the apathy into which it had sunk during the first period of the Victorian era, and of recent years such men as J. D. Sedding, Walter Crane, Heywood Sumner, Lewis F. Day, and C. F. A. Voysey had done much. For wall-papers he considered the best setting-off to be white paint, and in selecting papers pictures should be taken into account, for which a plain paper was the most suitable. In the case of oil-paintings, a brown; and in that of engravings and photographs a light yellow. In choosing papers with a pattern marked vertical lines will tend to heighten the room, whereas horizontal lines will make the room lower and longer. He then dealt with the manufacture of wall-papers, which he described in detail, and after which he explained the various kinds of papers, viz., machine papers, such as pulps, satins, micas, or satinettes, wool-flocks, silk flocks, ingrains, metal papers, bronzes, gilts, and sanitary papers. Hand-printed papers are from wood blocks and are for papers of a higher quality. Stencils are chiefly for friezes. He then spoke of arsenic in wall-papers, which used chiefly to be found in the greens. A rough mode of ascertaining if there is any present is to moisten it with a solution of ammonia. If arsenic of copper is present the ammonia will turn the paper dark blue. He then referred to paper-hanging and the tools required. For paste, wheat flour is considered the best, and unless gilt papers are to be hung a small quantity of alum is added, and sometimes a little borax or carbolic acid, to prevent insects eating through the paper. Great stress was laid on the necessity of old papers being stripped off before papering with new, and he thought local by-laws should render this obligatory, and, should there be any dampness, a lining of tin-foil should be put first. A varnished paper is difficult to hang. The paper should be hung unvarnished and varnished afterwards. Lastly, with regard to the wall-paper trade generally, he referred to the fact that in recent years German manufacturers had sent papers over to England in English sizes, and were now far more numerous than formerly. A striking feature, too, in the trade was the large number of pattern-books brought out at great expense, and of the extensive show-rooms with large panels of wall-papers to show general effect.

Mr. Dale opened the discussion by saying he thought we should have Mr. Sheffield proposing to legislate about wall-papers, and have a Board appointed to examine them, and then have them hall-marked. As to the client, he thought he should have what he liked, and choose his own papers. He was interested in the paper, but would like to have heard more about the manufacture of papers with regard to their design.

Mr. Jenkins also wished Mr. Sheffield had dealt more with the artistic side of the question. With regard to the Chinese wall-papers to which Mr. Sheffield had referred, they used to make papers with a continuous design, *i.e.*, without any repeat. On points to be observed in selection of wall-papers, he thought aspect should be considered. The question of fading was not touched on; some papers absolutely changed colour.

Mr. Jacob thought new plastered walls should not be papered for about a year.

Mr. Neighbour said painted walls should have lining paper first; otherwise the joints will be liable to open as the paper shrinks in drying.

Mr. Turner said he had heard that for cleaning wall-papers, stiff dough was good if you rub down, and not more than one way.

Mr. Towse referred to papering on new sirapite plastered walls, and had found it turn the colour. The best thing to do was to leave the walls bare till thoroughly dry.

Mr. Wannocott also condemned sirapite plaster for wall-papers, especially if the paper has gold in its pattern, which will turn absolutely black.

Messrs. Foster, Nicholson, Attlee, and Hamp also spoke, and after some general remarks from Mr. Lishman, the Chairman, Mr. Voysey, the Special Visitor, summed up the discussion, first with some advice on designing wall-papers, ideas for which he said could well be gathered from Nature and one's surroundings. A man who studies Nature, and especially the flowers, and thinks, should be able to express his impressions in a design—and if he could not he never would be able to design wall-papers. If you think, you must design. Speaking of one of his own papers forming an exhibit of the subject of owls, he pointed out how the manufacturer had spoilt it in the colouring. The subject necessitated cold colours for an evening aspect. There the manufacturer had ruined the design by printing the background bright red and the leaves bright green, and on his demurring to it, he was told that the colours used were so much better than those he had put! Another case he had known, where a sea-colour had been anything but a sea-colour. As to patterns, a drop pattern is a dangerous one to tackle, because it will often give you diagonal lines, which look bad. With regard to new plaster, he had used Eltonbury on ordinary, but not on sirapite, the danger of which he thought was due to the lime in it. The best way was to let the plaster stand a year. As to limitations of design, design should be kept flat. We do not want perspectives and

light and shade; the modern stencils do this and are bad. If papers are well balanced, the fact of fading does not matter. Morris's papers are nice, even when they have faded. On choice of colours we should follow Nature. She has given us greens, and it is the most soothing of all colours.

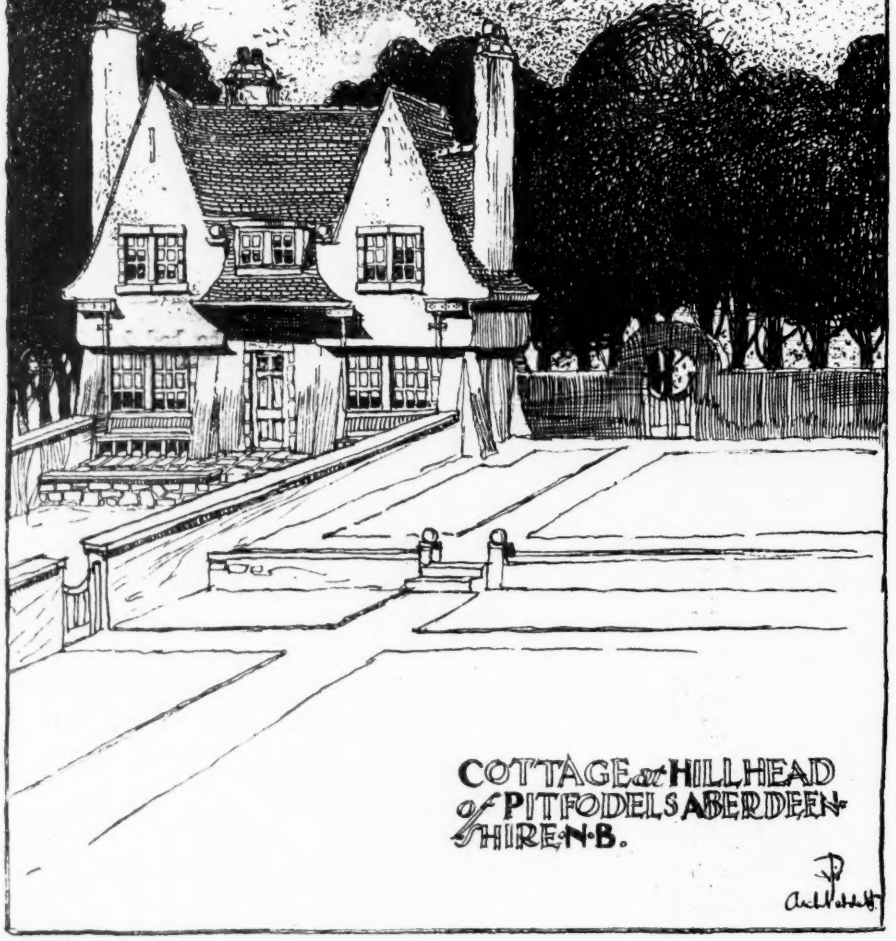
Mr. Sheffield then replied to the various questions raised, and the meeting terminated.

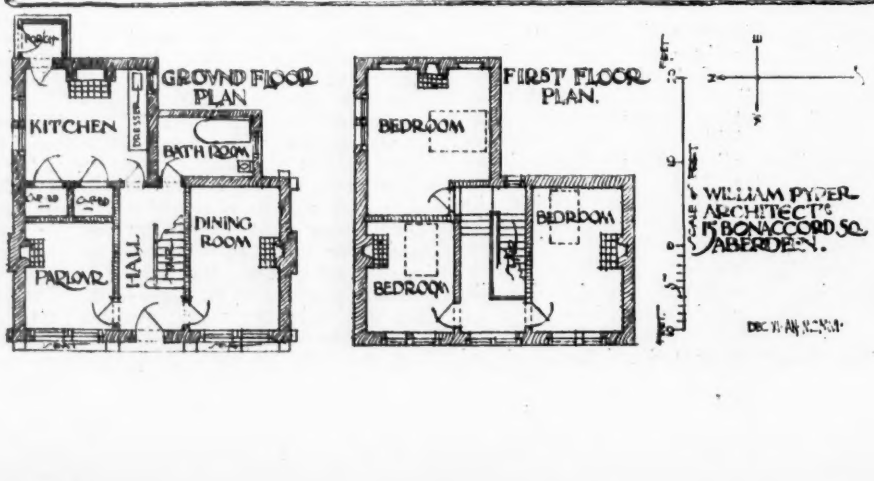
COTTAGE, HILLHEAD OF PITFODELS, ABERDEENSHIRE.

THIS cottage was built for the greater part of stones collected from the fields, granite from Rubislaw Quarries being used for headers, for dressings round external window and door openings, and for corbel course. The roof is laid with Port Dinorwic blue slates. The external surfaces of walls are harled. The rain-water pipes and heads on front elevation are of cast lead. The external woodwork is painted white.

The contractors were the following:—Mason's work—Mr. Robert Buehaw (Aberdeen); carpenter's and joiner's work—Mr. W. Dufftown (Muchalls); plumber's work Mr. A. R. Will (Cults); plaster work—Messrs. J. Stephen & Son (Aberdeen); painter's and glazier's work—Messrs. A. Ferguson & Co. (Aberdeen); slater's work—Mr. Alex. Murray (Aberdeen).

The architect is Mr. William Pyper, of Aberdeen.





THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

WORKS have been received for the Institute prizes and studentships 1906-1907 under motto, device, or signature as follows:—

The Institute Silver Medal and Twenty-five Guineas (Essays).—Subject, the influence of the use of iron and steel on modern architectural design.—1, "Autres temps autres mœurs"; 2, "Dorus"; 3, "Fonte"; 4, "Press Onward"; 5, "Sanctus Raymundus"; 6, "Three Ages."

The Institute Silver Medal and Ten Guineas (Drawings).—Subject, measured drawings of ancient buildings in the United Kingdom or abroad.—1, "Adze": 5 strainers (Trinity College Library, Cambridge); 2, device of heraldic head of horse: 5 strainers (Kirby Hall, Northants); 3, "Spero": 5 strainers (The Orangery, Kensington Palace); 4, "Swallow": 6 strainers (Stoke Castle, Shropshire); 5, "Thrums": 5 strainers (St. George's Church, Hanover-square); 6, "Waynflete": 6 strainers (Magdalen College, Oxford).

The Soane Medallion and 100*l. (for Continental travel).*—Subject, design for a large city hotel facing a public square.—1, "Applique": 6 strainers; 2, "A.T.": 9 strainers; 3, "Aero": 6 strainers; 4, "Cameo": 6 strainers; 5, "Cid": 7 strainers; 6, "Dentil": 7 strainers; 7, "I Parve": 7 strainers; 8, "Kokrel": 6 strainers; 9, "Novo": 7 strainers; 10, "Pan": 3 strainers; 11, "Pax": 7 strainers; 12, "Rush": 6 strainers; 13, "Silver Shield": 7 strainers; 14, "Simplex": 5 strainers; 15, "Urn": 4 strainers.

The Owen Jones Studentship: Certificate and 100*l. (for travel and study of colour).*—Applications and drawings from:—1, Robert Atkinson: 6 strainers; 2, Arthur R. H. Jackson: 6 strainers.

The Pugin Studentship: Silver Medal and 40*l. (for travel in the United Kingdom).*—Sets of drawings from:—1, F. Townson Clark: 6 strainers; 2, A. J. Margetson: 6 strainers; 3, Wilfrid I. Travers: 6 strainers.

The Tite Prize: Certificate and 30*l. (for travel in Italy).*—Subject, design (according to the principles of Palladio, Vignola, Wren, or Chambers) for a loggia for sculpture to screen the blank end (150 ft. long) of a building.—1, "Altiora Petamus": 3 strainers; 2, "Crown": 4 strainers; 3, "Cheiro": 4 strainers; 4, "Delta": 4 strainers; 5, "Ecclesiastes": 4 strainers; 6, "Forced Draught": 4 strainers; 7, "Gradus": 3 strainers; 8, "Heart-easing Mirth": 5 strainers; 9, "Hermit": 4 strainers; 10, "Ionicus": 3 strainers; 11, Device of a Wreath: 3 strainers; 12, "Meg": 6 strainers; 13, "Nisi": 5 strainers; 14, "Orne": 3 strainers; 15, "Robinson Crusoe": 3 strainers; 16, "Si jeunesse savait: si vieillesse pouvait": 4 strainers; 17, "Spread Eagle": 3 strainers; 18, "Valhalla": 4 strainers; 19, "Vincit qui patitur": 3 strainers; 20, "Vita": 3 strainers; 21, "Vignola": 5 strainers.

The Arthur Cates Prize: Forty Guineas.—Drawings have been received from:—1, W. W. J. Calthrop: 6 strainers; 2, Frank Dyer: 6 strainers; 3, W. Dathy Quirke: 6 strainers.

The Grissell Gold Medal and Ten Guineas (for design and construction).—Subject, design for a grand stand constructed of timber on a race course.—1, "Hurst Park": 4 strainers; 2, "Royal Ascot": 3 strainers; 3, "Septre": 4 strainers; 4, "Video": 5 strainers.

At the fifth general meeting (business) of the Institute for session 1906-07, held on Monday, January 7, Mr. Thomas E. Collcutt, President, in the chair,

The Hon. Secretary having announced the decease of Mr. Henry Simpson Legg, Mr. Horace T. Bonner expressed his deep regret and sense of personal loss at the event, and paid a tribute of respect to the high character and merits of the late member.

The Secretary (Mr. Locke) read, translating into English, a letter from M. H.-P. Nénot, President of the Central Society of French Architects, presenting to the Institute on behalf of his society a gold medal in commemoration of the Seventh International Congress of Architects, whereupon the thanks of the meeting were accorded the Society by acclamation, and the Secretary was instructed to write expressing the thanks of the Institute and its cordial appreciation of the gift.

The Hon. Secretary formally announced the receipt of donations to the library, and on his motion a vote of thanks was passed to the donors.

The following candidates for membership were elected by show of hands under by-law 9:—

As Fellows:—Messrs. C. S. Spooner and T. H. Weston (Bristol).

As Associates:—Messrs. M. J. Dawson and H. G. Leslie, F.S.I. [Special Examination].

The following were elected *en bloc* by acclamation:—

As Hon. Corresponding Members:—R. Böker (Member of the Imperial Society of Russian Architects, St. Petersburg); L. Bonnier, President of the Société des Architectes diplômés par le Gouvernement Français, Architecten-Chef des Bâtiments Civils et Palais Nationaux; F. Miles Day, President of the American Institute of Architects, Lecturer on Architecture at Harvard University (Philadelphia, U.S.A.); Jean-Joseph Caluwaers (Brussels); Mariano Eduardo Cannizzaro (Rome); Cass Gilbert, Vice-President American Institute of Architects (New York, U.S.A.); Georges Harmand, Avocat à la Cour d'Appel, Paris, Member of the Judicial Council of the Société Centrale des Architectes Français (Paris); H. Helmer, K.K. Oberaurath (Vienna); Virgil Nagy, Building Councillor to the Kingdom of Hungary, Professor at the Hungarian Technical University (Budapest); Ludwig Neher (Frankfort-on-Main); George B. Post, Chevalier of the Légion d'Honneur (New York, U.S.A.); Jacques Maurice Poupinel, Architecte diplômé par le Gouvernement Français (Paris); Abraham Salm G.B.zn (Amsterdam); Ventura Terra (Lisbon); Don Fernando Arbós y Tremanti, Member of the Spanish Academy of Fine Arts, Inspector-General of Works at the Ministry of Fine Arts, Madrid; Gustaf Wickman (Stockholm).

The President having called on Mr. Herbert W. Wills to bring forward a motion of which he had given notice with reference to the employment of public officials for public works of architecture, objection was taken that, the matter of Mr. Wills's motion having been discussed and voted upon by the Institute so recently as December 3 last, it was contrary to precedent and out of order to bring what was practically the same question forward again after so brief an interval.

The President having intimated his opinion that it rested with the meeting to decide whether the motion in question should be proceeded with, a resolution, formally moved by Mr. W. E. Riley and seconded by Mr. R. J. Angel, that the meeting pass to the

next business, was put from the chair, and declared carried on a show of hands.

Mr. William Woodward, in accordance with notice, drew attention to the proposed conditions of competition for the new London County Hall, with especial reference to the proposal to invite certain architects to submit designs in the final stage of the competition, and moved the following resolution :—"That this meeting is of opinion that all drawings for the competition for the London County Hall, including the designs of the eight selected architects, be sent in on one and the same day. The meeting also decides that a copy of this resolution be forwarded by the Secretary of the Institute to each of the architects who are members of the Institute, and that a similar copy be forwarded to the London County Council."

The subject having been discussed at some length, an amendment, moved by Mr. W. D. Caröe, and seconded by Mr. Maurice B. Adams, in the terms of the resolution set out below, was carried by a large majority; and, having been put as a substantive motion, the meeting resolved: "That the London County Council be invited to extend the time allotted to the two competitions to nine months, of which six shall be devoted to the first competition."

Mr. K. Gammell, in accordance with notice, brought forward the following resolutions :—(1) "That in view of the fact that limited competitions for public buildings erected with public moneys are a great injustice to the young and unknown members of the profession struggling for recognition, and also not in the best interests of the promoters, this Institute declares that such competitions should not be limited, and should take such steps as may be deemed advisable to discourage public bodies from instituting such competitions." (2) "That this Institute exert its influence in obtaining the abolition of the growing custom of penalising non-competing architects by retaining their deposit."

Mr. Gammell read some remarks in support, and moved his first resolution, which was seconded by Mr. William Woodward.

An amendment by Mr. G. A. T. Middleton, seconded by Mr. H. H. Statham, proposing the insertion of the words "except geographically" after the words "should not be limited" was put to the vote and negatived.

A further amendment by Mr. Henry T. Hare, seconded by Mr. Edwin T. Hall, proposing that the question be referred to the Competitions Committee to consider and report to the Council, was also put to the vote and negatived—twenty-two voting for and twenty-seven against.

The resolution as first moved was then formally put from the chair, and it was resolved: "That in view of the fact that limited competitions for public buildings erected with public moneys are a great injustice to the young and unknown members of the profession struggling for recognition, and also not in the best interests of the promoters, this Institute declares that such competition should not be limited, and should take such steps as may be deemed advisable to discourage public bodies from instituting such competitions."

Further, on the motion of Mr. K. Gammell, seconded by Mr. Edwin T. Hall, it was resolved: "That this Institute exert its influence in obtaining the abolition of the growing custom of penalising non-competing architects by retaining their deposit."

Upon the motion, in accordance with notice, of Mr. Herbert W. Wills, the meeting, without further discussion, unanimously resolved: "That this meeting considers that the assessor in a competition should refrain from any expression of doubt as to the relative merits of the designs placed in his award, such expression of doubt being calculated to weaken the effect of his award and to lead the promoters to override it, to the great detriment of the object aimed at—viz., the adoption of the best design."

The proceedings then closed.

SCHOOLS, COPNOR, HANTS.—The opening of the new schools which have been erected at Copnor took place a short time ago. Mr. Vernon-Inkpen was the architect, Mr. J. Cockerell being the builder, and Mr. Saskell clerk of the works. The work has been carried out at a cost of about 18,000*l*.

THE SURVEYORS' INSTITUTION: SANITARY LAW.

AN ordinary fortnightly meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, S.W., Mr. George Langridge, President, in the chair.

The minutes having been read and confirmed and some donations to the Library and Library Fund announced, the discussion was resumed on Mr. E. H. Blake's paper entitled "Some Notes on Sanitary Law," read before the Institution on November 26. In the discussion which took place on that occasion,

Mr. A. R. Stenning said that the whole subject was a pressing one, which must be dealt with in the every-day experience of surveyors, who were called upon to express opinions about sanitation, and must be familiar with all the up-to-date requirements of the authorities. If by codification the Public Health Acts and other Acts could be brought into one concise form, the law would be more intelligible both to surveyors and to the public they were called upon to serve.

Mr. T. W. A. Hayward said that some years ago the public hardly realised that sanitation applied to anything but the carrying away of foul matter from a house by drains. Sanitation, as now understood, embodied things perhaps even more important than drainage; for instance, the planning and ventilation of dwellings. How often a house could be found where the drains were, perhaps, properly planned, but the water-closet or ash-pit, or something of an equally objectionable nature, was immediately outside the larder, or with the doorways side by side. With regard to damp, even where the damp-course was efficient and the walls perhaps properly built, the site on which the house stood was often practically unprotected. He had frequently found houses built on a marshy or clay soil without concrete over the site, and, although no dampness rose in the walls, it came up through the floors directly the fires were lit. As to materials, one frequently found houses with walls built of porous bricks, through which one could almost feel the dampness driven during heavy rain. One of the most interesting features of Mr. Blake's paper was the concise way in which he had brought together the various interpretations of that ever-vexed question, "drain *v.* sewer." The borough which he represented had during the last seven years spent something like 20,000*l*. owing to what he would call the misinterpretation of the words "sewer" and "drain." The law should be altered, and he hoped the members of the Institution would join with members of other professional bodies in trying to attain that end.

Mr. H. Courthope-Munroe said that, although it had been suggested that lawyers regarded the question of "drain" or "sewer" rather as one of personal profit, efforts had been made, by himself and others, to get the matter set at rest. He quite agreed that it was a scandal that such a state of things should have gone on so long. Judges had expressed very strong opinions as to the hopeless state of the law on the subject, and in 1895, after deputations to the Local Government Board, Mr. Walter Long stated that he took the view of the local authorities on the matter, and various conferences then took place among these authorities. Then the Woolwich case arose in 1899, and to him fell the invidious task of drafting a definition of a drain for the rest of the world to criticise. The matter came before the Committee of the House of Commons, who were asked to sanction the clause which would be the first step towards putting the matter right. The Committee expressed agreement with all that had been said, but decided that the matter must be dealt with by a public Bill so far as it was a general one. Mr. Blake had dealt with the question of a rain-water pipe, which, having been connected with a drain, converted it into a sewer. From the point of view of the man in the street, who knew nothing of law, there could hardly be anything more ridiculous than that. Because somebody surreptitiously connected a drain with another drain in a yard, or ran some other rain water off into such a drain, the whole system was sometimes thereby converted into a sewer, and, instead of the man who owned it being compelled to put it straight, the ratepayers in general were called upon to make good and maintain it. Mr. Justice Channel in the Fulham case had gone further in legal subtlety, and it now seemed that if a house having a drain with a gully had the rain water of another house connected with it at that point, the whole thing became a sewer from the gulley head; but if, before the rain water discharged into the drain, a few yards of rain-water pipe intervened, there was very considerable doubt if this drain became a sewer.

Mr. A. P. I. Cotterell said that it seemed to him that much of the confusion, expense, and annoyance that had arisen in connexion with the question of "sewer *v.* drain" was due to the fact that local authorities had not carried out the statutory duty laid on them to make such sewers as were necessary for the draining of their districts. The law required them to do it, but in most large towns which were increasing in size it would be found that sewers were, as a rule, either made by the estate owner or by the jerry-builder, and the local authority came afterwards and took them over, when such trouble arose as had been referred to in the paper. When the model by-laws were promulgated by the Local Government Board, the then President of the Board stated that they did not propose to give any model by-laws with regard to sewers (though he thought the 157th section allowed for by-laws for the construction of sewers in new streets), because, the President said, it was the duty of the local authority to provide them. From that time he did not think that more than a dozen authorities had received sanction for such by-laws. They did without them, and left it to estate owners to construct the sewers. Of course, they had power to arrange with the owner to make a sewer at the owner's expense, but there was no compulsory power. If the local authority either constructed the sewer at their own expense or had compulsory power to make the owner pay for the cost, or part of the cost, of the sewer, which would then be constructed by the authority, a great deal of confusion and expense would be avoided. Again, common sense would seem to suggest this course, for sewers could then be made with more coherence of design than at present. There was no attempt in laying out sewers on estates to make them suitable for the drainage of other estates, and this was in itself a source of large expenditure on the part of local authorities. With regard to surreptitious connexions, it seemed inconceivable that such cases should arise as had been referred to. It was simply a form of robbery. He should have thought that any connexion made without the knowledge and consent of the local authority ought to be illegal. As to house drainage, he quite concurred in the opinion that it was well to be reasonable in our requirements. It was quite possible to make too much of slight defects, and to demand entire reconstruction where reasonable repair would meet the case. He thought there was rather a tendency on the part of some surveyors to frighten owners or occupiers into thinking there must be something radically wrong, and surveyors would do much more wisely if they were reasonably discreet, and did not make too much of defects which were often existent rather in theory than in actual fact.

Mr. Alfred King said that much had been made of the requirements of sanitary law, but up to the present time he had not heard one word on the other side of the question from the point of view of the owner, against whom everything seemed to be directed, regardless of his interests. Personally, he maintained an open mind on the matter, and he held that anyone who drafted or had anything to do with sanitary by-laws should look at the question from every point of view, and not sacrifice one interest to another. Everyone had his rights, but this was not always recognised by the by-laws, which in many cases had, no doubt, had a very prejudicial effect on the development of property. Reference had been made to the mischief due to an imperfect damp-course, but in many instances which he could mention there was no damp-course at all in the walls, the reason being that at the time the building was erected damp-courses were unknown. Among the estates with which he had to do was one in London, where, among

some 100 houses, he would undertake to say there was not a single damp-course, and yet whenever damp showed on the internal walls he received notice from the Council notifying that the buildings were damp, and must be remedied. Many of the other by-laws were found in practical experience to be absolutely unworkable. In the case of the ventilation of drains, one by-law said that there should be two pipes (to have an internal diameter of not less than 4 in.) ventilating a drain, one at the lower and one at the higher level of the drain. Yet further on it would be found that a soil pipe of 3½ in. diameter would suffice at the top end. One or the other must be wrong. Then as to water-closets in basements in new buildings, it was provided that there should be a space of 40 ft. superficial area outside open to the sky. Was that necessary? At the present time he was dealing with a number of buildings in course of erection in different parts of London, and found it very difficult indeed to give that space without sacrificing the building in many respects. He feared that the by-laws had been passed without due consideration, and surveyors who, like himself, had to get their plans adapted to existing circumstances felt the impossibility of trying to work to regulations, which in many instances did not really meet the case.

At the meeting on Monday,

The Secretary read various communications which had been received dealing with the points raised in the paper.

Mr. Nisbet Blair, Borough Surveyor, St. Pancras, expressed the hope that the Institution would urge the Government to pass some simple legislation such as had already been enacted for particular districts, and so remove the anomalous position which resulted from the interpretations by the courts of the words "drain" or "sewer," because it was a serious matter that the cost of dealing with drains on private property should fall on the local authority. A few years ago this cost St. Pancras 5,000*l.* a year.

Mr. Pickering, Borough Surveyor of Cheltenham, expressed the view that the author of the paper was wrong in saying that the local authority could, if there was a proper sewage system, insist on water-closets being provided. It was, he said, quite within the power of the property owner to provide a privy, and the model by-laws fully recognised this. The author might possibly not be aware that there were comparatively few authorities in the provinces that had power to deal with the drainage system except in the case of new buildings. The model by-laws of the Local Government Board, which had been generally adopted, applied only to new premises. He approved of the application of the water test to new drains, but could not agree that it was necessary to condemn a drain merely because it would not hold water under pressure. He suggested that there should be a joint conference of the various institutions interested in order clearly to define what was required, and press their recommendations on the Local Government Board with a view to early legislation.

Mr. T. W. A. Hayward, in resuming the discussion, first referred to the specific instance given by the author where the Acts of 1855 and 1875 differed in a most important matter, *i.e.*, on the question of level. This, he said, had brought surveyors in the provinces into difficulties on many occasions, and it was strange that such an important item as level should be omitted from the later Act. He was strongly of opinion that the supervision of all drainage and sewer work, as well as the ventilation of buildings, should be under the charge of the surveyor, and, generally speaking, the Borough Surveyor was best qualified by professional training to undertake such work. He knew a case in London where the supervision was placed in the hands of the sanitary inspector, who insisted on ventilating a drain by having inlet shafts at each end, and also a pipe, 6 ft. high, from the middle of the drain. In practice, one knew that the air would not go out by the middle pipe. Dealing with the question of nuisance, the one item which struck him most forcibly was as to the examination of drains. He agreed that there was no statutory power to test drains, but there was an implied power, for the Act of Parliament provided that the surveyor might examine drains, and for the purpose of such examination uncover the pipes. It was evident that the common-sense view was that, if the surveyor had power to open up drains to examine them, he must have some means of discovering where the defects were; and was it not better to apply some test before the drains were uncovered, for this would save a good deal of expense to the owner. Then came the question of which was the best test to apply. Smoke might be used, but if a drain was defective smoke would not penetrate through several feet of soil. To his mind, the most reliable and efficient test was the water test, and if a drain would not stand pressure by water to the extent of a head of 1 ft., it was not fit for the purpose. If it would not stand with water, it certainly would not stand when blocked with liquid filth. He felt that there should be no sentiment in such a serious matter, and neither should the question of law be involved when the question was whether a drain was sound or otherwise fit, because they had to consider, not only the health of the family immediately concerned, but of the community at large.

Professor Robinson pointed out that a matter which had relation to the subject being discussed was as to the standards which were in future going to be applied for the discharge of sewage into rivers and estuaries, and for their guidance in this matter he referred them to the cases of Gifford *v.* the Corporation of Chichester, and the Emsworth oyster-bed case, where it was held that there was no prescriptive right to pollute a river or estuary. A point with reference to sewerage which was causing great difficulty now was in connexion with the disposal of trade waste. At present each case had to be decided on its merits or demerits. It might be that the largest trader in the town wanted to discharge his trade waste into the sewage system, and the point which had so far been considered was whether that had been done in a reasonable way. There had been several cases partly fought, but the point had not been finally settled. With reference to house drains he took the view that a defective house drain was a menace to health. In the Southwark case it was contended that the water test was an unfair one, but he agreed with Mr. Hayward that unless they applied a proper test they could not tell whether the sewage of a house was passing underground and doing mischief. It was said in the Southwark case that hardly a house in the locality would pass the water test, and all he could say was, "So much the worse for the occupants of the houses." On the point of several houses draining into one house drain or sewer he was consulted in a case at Islington, where Mr. Stephens, the ink manufacturer, built some works and erected a row of houses for his workpeople. All the sanitary arrangements were in the yards at the back of the houses, and he wished to lay one sewer into which all the houses should be drained. The then vestry required him to lay drains under each house into the public sewer. He pointed out that from a sanitary point of view as well as that of expense this would be an unwise thing to do. The London County Council held an inquiry and upheld his view.

Mr. S. G. Turner, speaking as an old Borough Surveyor and now as a barrister, said that to the lay mind the words of the Acts relating to the metropolis defining a drain would appear sufficiently comprehensive, but to the minds of surveyors and lawyers they must present a nightmare owing to the difficulties which had been raised. It had been held that two semi-detached villas were one building, and also that the question of what was more than one building must be determined on the merits of each case. In the case of the Lowther Arcade the drain was held to be a sewer, although the gates of the Arcade were closed each night, and in the case of Pilbrow *v.* Shoreditch, which related to a block of artisans' dwellings, it was decided that a drain which went into a sort of courtyard between two sections of the block was a drain and not a sewer. In the case of the Hackney Borough Council *v.* Billings the local authority delegated their power to make orders of combined drainage to their Surveyor, and it was held that they had no such right and that every plan which had been authorised by the Surveyor was not authorised by the authority and that the pipes laid under those plans were sewers and not drains. The author made the statement that a man was not responsible for the wrongdoing of his predecessors in title, but he felt that was a little too wide. What the Lord Chief Justice said in the case of Heaver *v.* the Fulham Borough Council was to the effect that the ownership was now divided, but that if the present owner had held the two houses from the original wrongdoer he might be liable as the original wrongdoer would have been. He thought the judges were getting a little tired of these cases and he considered that a rather unfair burden was being in many cases forced on local authorities. He personally approved of the water test, and said emphatically that it was the only adequate test by which they could really find out whether a drain was fit to do the work it had to do. He believed he had found some sanitary work which was not covered by the complete London County Council by-laws, which was the case of the construction of public-house urinals. He had gone through those laws and he did not know whether they came under a notice which stated the urinal to be a privy or a piece of apparatus. The author made a statement that in the case of a person doing work to abate a nuisance and then finding out that he was not liable he could not recover the cost from the local authority unless he had done the work under legal pressure. He dissented from that view and instanced the case of Moore *v.* the Fulham Council, where a man was served with a summons to make up a new street. He did the work, and finding afterwards that he was not liable he proceeded to recover the cost, and it was held that his remedy would have been to have resisted legal process.

Mr. H. Griffin (Paddington) said that the general view of the speakers appeared to be that it was a gross injustice for a public authority to be compelled to expend money received from the general body of ratepayers on work which was on the property of private owners, but after all the Metropolitan Borough Councils were only the successors of the old vestries and their piteous whining for relief did not deserve much sympathy. The Acts defined drains and sewers in a way which seemed to be fairly clear. It was true that for thirty years or more nobody was shrewd enough to think that the section meant what it said, and the old vestries and their officials made a mistake. In this country if a man exceeded his rights and went to court and was worsted he had to put up with it, and so it was in this matter. The authorities could have protected themselves and now they had to thank themselves. There were two things which he thought could not be too strongly condemned. The first was the habit of Council officials endeavouring to get owners to reconstruct sewers when they knew that the local authority was responsible for the work. In the second place it often happened that sanitary inspectors served notices on owners, and when the owner refused to carry out the work, as it should be done by the authority, proceedings were dropped and nothing more was heard of the matter. He considered that altogether wrong, because if a drain was defective then it was the duty of the local authority to see that it was rectified irrespective of whom the expense should be borne by.

Mr. A. Harston said that the case of the Wood Green Council *v.* Joseph referred to by the author had since gone to appeal and the appeal was dismissed, so that the law as quoted by Mr. Blake might be taken to be quite settled. The report was to be seen in the *Builder* of December 8 last. One point he would like to refer to was raised in the case of Wilkinson *v.* the Landaff Council in the Court of Appeal, and it was held that a surface-channel at the side of the road was a sewer because the rain water pipe which collected the water from several houses discharged into it. If carried to its logical conclusion it appeared to him the rain-water pipe could not be distinguished from a rain-water drain, and must be a sewer.

Mr. Scorgie (Borough Engineer, Hackney) said that in the Billings case which had been referred to there was something more than appeared in the judgment. When the vestry delegated the powers to the Surveyor it was on the condition that he

should make a quarterly report of the plans passed to the vestry, but the Borough Council was unable to find that any such report had been made. Hence the drains laid between 1859 to 1866 to the number of 6,000 had now to be repaired by the residents of Hackney. He agreed that the duties of supervision should be in the hands of the Surveyor and not in the hands of the nuisance inspector, or, as he was called in London, the Sanitary Inspector. The author had stated that cement joints, if of fairly good quality, were practically everlasting, but he hardly endorsed that opinion. The cement, although of good quality, might be slightly worn when used, or too much cement might be used and too little sand, and this would cause trouble. There were hundreds and thousands of drains laid with cement in the last few years which would not stand the water test to-day, and he thought they would not get an efficient drain until they used iron pipes.

Mr. H. T. Scoble remarked that it had been held that a tidal estuary might possibly be a sewer.

Mr. H. Courthope Munroe said he could not see where any moral case could be made out for the pipes under a private house to be repaired by the local authority. Again, in the case of combined drainage it was always the case that where a combined system was carried out the houses were all built by one man. Because that man unloaded to different persons he could see no reason why the local authority should afterwards be saddled with the cost. He was the counsel in the Billings case. The facts were that the vestry as men of common-sense, knowing they were not experts in sanitary matters, said to their Surveyor, "You are an expert and we pay you to do the work; you do it and report to us quarterly." That was a common-sense way of looking at it, but the law said that there should be no delegation of power and that point decided the case.

Mr. Blake briefly replied to the points raised in the discussion and said there was no doubt but that the water test was the only absolutely trustworthy test of drains new or old. There was a peculiar idea that at some date after a drain had been laid it should be allowed to be non-water-tight, but he felt that if it was a menace to health when laid if it was not water-tight, it would be a meance to health at any time if not repaired. There was no doubt it would be much better if building estates were sewered by the public authority on behalf of the owners than in the haphazard method as at present. It had been contended that there should be a certain elasticity in the by-laws, but he held that they should be as definite as possible and should be rigorously applied. As to Mr. Turner's point with respect to the recovery of penalties he could only say that the statement in his paper was taken from one of the standard law reports.

Mr. I'Anson said he dissented from the view that all drains which did not stand the water test should be pulled up. If that was so in Streatham and Harrow they would have to pull them up every week, for no stoneware drain would stand there any time. He agreed that it would be better if iron drains were used and at Streatham he now laid iron drains.

FREEMASONS' TAVERN, GREAT QUEEN-STREET, W.C.

THE special committee appointed by the United Grand Lodge of England to consider the question of leasing the premises have resolved that tenders should be invited for the taking of a free lease for a term of sixty years. Amongst the members of the committee are Sir Walter Johnson (President of the Association of Valuers of Licensed Property), Sir Joseph Dimsdale, Messrs. Edwin Fox, James Boyton (Past-President of the Auctioneers' Institute and of the Estate Agents' Institute), Alexander Stenning (member of Council, Surveyors' Institution), H. L. Florence, Henry Lovegrove, and Mr. Henry Clarke, Chairman. The buildings, having a frontage of 82 ft. to Great Queen-street, comprise the well-known tavern (adjoining the Freemasons' Hall) and the Banqueting Hall, extending over an area of half an acre, and abutting upon Wild-court in the rear. Grand Lodge for England of the Society of Free and Accepted Masons was formed after a meeting held in London in 1717. A sum of 5,000*l.* having been raised by a tontine, Grand Lodge bought some property in Great Queen-street, where the Hall, designed by Thomas Sandby, R.A., was opened on May 23, 1776, Lord Petre being Grand Master. Sandby designed all the emblematical ornament, executed in plaster by Cox, of the great hall, which was the first building erected in this country with appropriate symbols of the craft and with apartments for the holding of lodges and other ceremonies. The interior is seen in a print after Stothard of the orphan children's procession, and there are drawings to scale in the "Crowle" Pennant and in Britton and Pugin's volumes for 1825-8. G. Bailey states in his chronological account of Soane's career and works (printed in the *Builder* of December 12, 1846) that Soane, who in 1813 had been elected Grand Superintendent of Works, built "the new grand Masonic Hall adjoining Freemasons' Hall in Great Queen-street in 1826." In 1786 William Tyler rebuilt the former tavern, behind which was the Craft Hall. The present tavern, Nos. 61-3, forms a portion of the combined and extended premises built in 1865-6, after F. P. Cockerell's designs as selected in open competition, for which was taken the site of Queen's-place, to the west: confer the illustration and plan in our columns of August 18, 1866, and Mr. W. Curtis Green's drawing, March 26, 1898. The statuary and carving is by Mr. W. G. Nicholl. After the fire on Thursday night, May 3, 1883, Bacon's Hotel, to the east, Nos. 64-5, was purchased for the new building—Mark Masons' Hall, of which C. H. Driver was the architect, and which serves for the Grand Lodge of Mark Master Masons, the Order of the Temple, the Royal Order of Scotland, etc. Seven years ago the site of Nos. 57-8, on the west side, was taken for the new wing containing the Secretaries' offices, the office-bearers' rooms, and the library and museum, built of red brick and Portland stone by Messrs. W. Cubitt & Co., in which Mr. H. L. Florence followed the general design of the eastern portion for his façade. In August, 1905, Mr. Florence, Grand Superintendent of Works to United Grand Lodge of England, was appointed architect of new buildings on the site of Nos. 8-14, Wild-court, and for the proposed reconstruction of the tavern, then recently vacated through the expiration of the lease.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS.

I.—SCOTTISH PROVIDENT INSTITUTION NEW OFFICES, AND ST. BARTHOLOMEW'S HOSPITAL EXTENSION.

THE spring visits commenced on Saturday, the 12th inst., when a large number of members took advantage of the facilities for seeing two important City buildings now nearing completion. The party assembled early in the afternoon at the new offices of the Scottish Provident Institution in Lombard-street, and, under the guidance of the architects' representative—the principals, Messrs. Dunn & Watson, being absent—a tour of the buildings was made. The space at our disposal forbids a lengthy description of what is a very fine work, on the most valuable site in London; but we hope to lay before our readers a more adequate account of the undertaking when the buildings are completed. A few general notes will thus suffice for our immediate purpose.

Vast quantities of solid Portland stone have been used in the work. The entire façades to Lombard-street and Mansion House-place are in this material, and the general arrangement of the exterior is a two-storied rusticated base carrying a heavy order of three-quarter columns embracing three floors. Further accommodation is provided in the roof. The main entrance in the centre of the more important front has a coffered barrel-vault, enriched with interesting carved and other detail. The staircase and hall are entirely in Portland stone, arranged in a somewhat semicircular plan, so that all the steps are radiating. The planning generally is very suitable, and some lighting difficulties well surmounted. Classic forms and sentiment are introduced, but the detail is treated in the spirit of Byzantine work, which, in many ways, is a welcome departure. The work is a splendid example of rapid building by an English firm. Messrs. Cubitt have arranged to have the whole work started and finished in 251 days.

At St. Bartholomew's Hospital the architect, Mr. E. B. I'Anson, discoursed upon the nature of the extension. Our readers will already be familiar with the project, which appeared in our pages of July 23, 1904. It will thus be remembered that, after considerable controversy, it was decided to extend this ancient London hospital, partly upon the site of the old Christ's Hospital School. The extension, arranged in a kind of quadrangular form, provides for a large out-patients' department, with a spacious waiting-hall seating 850 people, and is surrounded by twenty rooms for medical and surgical attendance for the heavy demands made upon this institution. Provision is made for the reception of accident cases, for which a separate entrance is made. Other accommodation is a large dispensary, the resident medical officer's quarters, operating-room, laboratories, lecture-room, nurses' apartments, and students' lunching-room.

The buildings are designed to harmonise with the existing façades, and Portland stone is again used in the new fronts. The inner walls are faced with white-glazed bricks, and the flat roofs are covered with asphalt. Hollow brick partitions and tiled linings are generally used throughout the building, which is essentially of a fire-resisting nature. The extension is, broadly speaking, a considerable enhancement to the institution, and should be much valued.

Architectural Societies.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The annual dinner of the Leeds and Yorkshire Architectural Society took place on the 10th inst. at the Queen's Hotel, Leeds. Over sixty members and guests were present. The President (Mr. H. S. Chorley) was in the chair, and the gathering included the Vice-Chancellor of the University of Leeds (Dr. Bodington), Mr. W. J. Locke (Secretary of the Royal Institute of British Architects), Mr. Henry Barran (President of the Leeds Chamber of Commerce), Mr. J. E. Bedford (President of the Leeds Institute), and Mr. A. E. Kirk (Hon. Secretary). The loyal toasts were proposed from the chair. Dr. Bodington gave "The Royal Institute of British Architects," observing that architecture was the most universal of arts, and its influence was wider than any other art could possibly exercise. They could go through life without seeing any pictures other than posters on the walls, but they could not avoid seeing noble buildings, and, therefore, as an educative art, architecture stood by itself. Historically it was equally valuable, and the genius of nations—ancient Greece and Rome for example—were permanently reflected in the work of their architects. What did an architect require? A sound, general education, a healthy public opinion, and friendly intercourse with his professional brethren and with architects from other lands. All these were supplied by the Royal Institute of British Architects, which played an important part in guiding public bodies.—Mr. W. J. Locke acknowledged the toast. Alluding to the question of registration, he said that a compromise between two opposing parties had resulted in the adoption by the Royal Institute of a scheme providing for a revision of the charter of the Institute, and for promoting a bill in Parliament, with the object of securing recognition in the professional sense of the diploma of the Institute. The report of the Committee which had been appointed would be published shortly. The object of the registration movement was to improve the status of the architect by ensuring that he should have a proper aristic training, and also that the public should be acquainted with the dignity of his work. That could not be done by a divided, but could by a united, profession. They had not to contend against the avarice of public bodies, but against the stupidity of the community. They had to awaken the public to the new artistic movement in architecture, and that must be done by the efforts of a combined profession. In an

appeal for support of the Institute, he pointed out that it had done much to raise the status of the profession generally.—Mr. S. D. Kitson submitted "The Allied Societies," and said that what architects thought to-day the public thought to-morrow. The alliance between the Royal Institute and the local societies took place, in the majority of instances, in 1889, and there were, he believed, eighteen of these allied societies. Referring to the disastrous effect of smoke upon Westminster Abbey, Canterbury Cathedral, York Minster, and other historic buildings, he suggested that the allied societies might take this question into consideration. The architectural profession was very much overcrowded and notoriously underpaid. There was, however, more mutual forbearance and help among architects than in any other profession, and this was largely due to the local or allied societies, which afforded the opportunity to members to meet, and to their connexion with the Royal Institute, which gave them the opportunity of thinking Imperially.—Mr. F. E. P. Edwards (Bradford) responded. He spoke of the educational value of the local societies, and claimed that they had justified their existence.—Mr. Butler Wilson proposed "The City of Leeds." Leeds was a commercial and manufacturing city of no mean order, and among the institutions of which they were proud was the University of Leeds. There had of late been so many banks built in Park Row that he suggested it should be named Bank Street. Twenty years ago Leeds had no vistas, but, thanks to an enlightened Corporation, they now had City Square.—Alderman C. F. Tetley, replying, said the Corporation were not always desirous of receiving advice, but he had no doubt that if the architects of the city were united, they would find an opportunity of making their influence felt.—"The Leeds and Yorkshire Architectural Society" was given by Mr. Henry Barran, who said that, perhaps, if some of them had to choose their vocation in life again they would prefer to be architects, not because of their artistic gifts, but because the architect's life had so many charms. It might, however, be said that an architect's life was not a happy one, because there were such things as building by-laws. There were two great pleasures in an architect's life—the pleasure of creating something, and the pleasure of producing something which was beautiful and artistic.—The President, replying to the toast, expressed the opinion that nowadays architects were not so much hard worked as hard pushed, for clients wanted everything done in a hurry. He believed that in future science and architecture would go more together than in the past, and that the University of Leeds would have a greater influence over architectural matters. In these days of electric cars, there was a great movement of decentralisation in process, and it would, no doubt, increase as time went on. In regard to the laying out of suburban districts, this country had done very little as compared with Germany, and he thought our local authorities ought to have greater powers than at present in the treatment and management of outlying districts.—Mr. Percy Robinson, in introducing the toast of "The Guests," suggested that Leeds was not architecturally a beautiful city, and that the criticisms passed upon it by Mr. Bernard Shaw were not altogether undeserved. The condition of the city was not so much due to the inability of the architects as to the apathy of the general public.—Mr. J. S. R. Phillips, in reply, humorously observed that when Dr. Bodington was speaking of the Royal Institute of British Architects he rather wondered how in the old days they managed to put up anything at all. When he compared some of the old ruins with the buildings of the present day, he was tempted to compare the civilisation of the present day with that of the past.

MANCHESTER SOCIETY OF ARCHITECTS.—The fifth general meeting of the students of this Society was held at the Society's rooms on Tuesday, the 15th inst. An "impromptu debate" took place, at which the following were among the subjects discussed:—"That an architect should fit himself for designing in all crafts"; "that an Oriental style of architecture is unsuitable to our English climate"; "that it is advisable for young architects to go into partnership rather than to commence practice on their own account." The above subjects and several others of a similar nature were debated on and put to the meeting to decide.

Archæological Societies.

LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY.—A meeting of the Lancashire and Cheshire Antiquarian Society was held on the 11th inst. Mr. Albert Nicholson presided, and the chief interest of the evening centred in a communication from Mr. F. A. Bruton, who has conducted the excavations on the western side of the Roman camp near Duke-street, Liverpool-road. In the absence of Mr. Bruton, the paper was read by Mr. J. J. Phelps. Describing the first work uncovered parallel to Duke-street, it was stated that it consisted of a floor of red sandstone, with a facing to the eastern side. Near this was found the Samian bowl and the prehistoric millstone. The excavations proved that the site assigned to the western rampart of the fort were incorrect. The constitution of the western wall which had been found appeared to be 2 ft. of clay, 1½ ft. of small boulders laid in puddled clay, and a mortared wall above. This wall had been found within a few feet of the site given by Whitaker for the western gate. It might be possible to lay that gate bare if the telegraph-post on the site was not close to it. To find that gateway would be a result of great archæological interest. There was about half an acre of ground occupied by the camp in the uncovered space being excavated, which would be about one-tenth of the fort. It was shown also how steeply the fort fell away towards the south-west, and how great an amount of clay was used by the Romans for foundations and possibly for other purposes. The same fact had been observed elsewhere. A great deal of clay appeared to have been laid on the floor of Mancunium. The floors it was found, were made of softer red sandstone. For facings the Romans appeared to have used the harder stone of the lower Permian beds, which is of lighter colour. The pottery found included red, yellow, whitish, and black ware. Portions of mortaria and amphoræ, and a number of fragments of Samian ware representing several bowls and pateræ; and pieces of millstones made of millstone grit and a perfect prehistoric millstone, apparently of the same material, had been found. Mr. Bruton, in his paper, warned the Society against laying too much stress on the exact position in which several things were found. The Samian bowl and the millstone were found *in situ*, but most of the fragments might have been tipped where they were found, with the exception of the moulded capital, which was found on the Roman level, and the pieces of mortaria which occurred pretty regularly along the line of the flooring. After reaching the bottom of the western wall the two coins—already described, which date about 211 A.D.—were found, and a great number of Roman tegulae and imbrices and some perfect Roman bricks. The Samian bowl was said to be of Lezoux fabric, the principal centre for the export of that ware from Gaul, and the date about 250 A.D. It was certainly not earlier than the reign of Hadrian, 280 A.D. Mr. Bruton said the word Samian died hard, like Prætorium, and it had been found difficult to substitute the phrase Terra Sigillata without appearing pedantic. Perhaps, it was remarked, it might turn out to be correct. Whether the red-stone floors were barracks or storehouses it was impossible to say. There were distinct indications that the larger of the two was a buttressed building. If that was confirmed it would be classed with the granaries or storehouses of other forts. It might be a Horreum of which Tacitus gave such graphic details in the Agricola. The suggestion was given with every reserve, for the Classical Association had endeavoured all along to err, if anything, on the ultra-sceptical side. The paper concluded with a paper from Dr. Haverfield, congratulating them in finding the western wall, and remarking that buttressed buildings were frequently found, and often near the ramparts. The tendency to use stone in buildings was undoubtedly in the late IInd and IIIrd centuries rather than in the late Ist or early IInd centuries.—Mr. G. C. Yates, Hon. Secretary of the Society, announced that the Council had made a grant of five guineas to the excavation fund as a first instalment.—Mr. C. Roeder read a paper on the subject, and congratulated the Classical Society on the results of the evacuations, which had yielded results confirmatory of their previous knowledge. He said it was fortunate the foundations had been covered by 3 ft. to 8 ft. of tip, or otherwise the evidences found would have been wiped out long ago. Unfortunately, they could not excavate where the northern gate probably was, in Duke-place. He rather belittled the importance of the "finds," and accused the Press of exaggeration. The excavations were of great local archæological interest, but certainly not of national importance. They must bear in mind that it was only a small fortress.—*Manchester Courier.*

Fifty Years Ago.

FROM THE *Builder* OF JANUARY 17, 1857.

RAILWAYS ON COMMON ROADS.

IT has been well observed by an eminent French engineer, in relation to locomotive facilities, that "to retrograde is somtimes a progress"; and this apparent contradiction of terms is really true in many instances.

It is undoubtedly applicable to the formation of a series of what may be termed secondary railroads, or tramways, on common roads, worked by horse-power, now energetically demanded by our French allies, and usefully employed in America—for Brother Jonathan can go slick ahead, as far and fast as anybody when it suits his purpose, and retrograde with equal facility where an advantage is to be gained. And why not? Why should people deprive themselves of the pleasures and advantages of cheap conveyance because they cannot afford to construct a spick-and-span new locomotive railway, with deep cuttings, high banks, showy bridges, and splashy stations?

It will not pay to make expensive locomotive railways everywhere, to every village and hamlet ambitious of being introduced into the world on a railway of its own: however, where locomotive lines cannot be made, tramways can, at one-tenth of the cost of the former, and quite as useful, if not so grand and noisy. Where it will not pay to put down a tramroad, the inhabitants must be content to jog on in the even tenor of their way as usual—trudge through muck and slush, stick in ruts, or stop at home out of harm's way.

Where towns are placed at a moderate distance from the main trunk line, and the traffic would not be sufficient to pay for the construction of an expensive locomotive branch, they may be readily tied to the main artery by an improved tramway, and thus at small cost reap the benefit direct by railway transit.

It is better to have a serviceable tramway than be cut off from the main line; for a town in the latter predicament is isolated, checked in its progress, and kept behind the age, all for the want of a few yards of rolled iron!

Why should tramroads be despised in practical England, and ignored in London and its endless suburbs? Why should people laugh at the idea of *horse railways*—of tramways on our common roads? Perhaps because they are old-fashioned, and have been put in the shade by locomotive lines. But this is sheer nonsense. All are useful in their proper place.

*** What we urged fifty years ago has only within the last decade become an accomplished fact.

Illustrations.

BIRMINGHAM COUNCIL HOUSE EXTENSION.

WE have devoted our plates this week to giving as full an illustration as possible of the selected design, by Messrs. Ashley & Winton Newman, for the important scheme for the extension of the Birmingham Council House. It is satisfactory to note that this extension,

which forms architecturally a separate building, is in a very much better architectural style than that of the existing building.

The following notes by the architects will serve to explain their purpose in the design:—

"In laying out the buildings on the site it has been considered essential, both for economic and æsthetic reasons, that the boundaries of the streets as shown on the block plan should be adhered to.

The details of the scheme are clearly set forth on the drawings. Speaking generally no deviations have been made from the 'instructions,' excepting possibly in the planning of the Education Department, where, owing to the position of the levels of the floors in relation to the levels of the streets, the lower ground floor in Margaret-street becomes a full story in height, enabling it to be utilised by certain sections of the Department instead of only as stores, thus bringing the planning more in accordance with that of the existing education offices.

The buildings have been so placed on the site as to leave the greater part of the frontage to Great Charles-street free, and also a large portion of the interior of the site. Future buildings are outlined on the plans, and it will readily be seen that on the lower floors an extension of office accommodation could be arranged, and on the upper floors a fine extension of the art galleries or a suite of museums with central entrance and staircase in Great Charles-street.

The Departments to be housed in the new buildings are—

1st. Gas Department, with central entrance in Edmund-street, and Stores entrance in Margaret-street.

2nd. Education Department, with central entrance in Margaret-street.

3rd. Health and Housing Departments, with entrance in Congreve-street; and

4th. Tramways Department, with entrance also in Congreve-street.

The Art Galleries are placed on the first floor, and have their only approach across the bridge over Edmund-street from the existing round gallery.

Exterior Architectural Treatment.

In designing the new buildings it has been felt that the scale of the existing Council House is too large to be closely followed, the height of the cornices and stories generally being greater than is requisite for the new buildings, but the extension has been designed with due regard to the type of architecture required to harmonise with that of the existing buildings. It is proposed that the heavy plinth be worked with large 'bulging' courses, finished with a rough axed surface, the walling above this up to the first floor string to follow the coursed work of the existing building, this first floor string being continued across the bridge and meeting the string mouldings on the Edmund-street front of existing buildings, the bridge thus forming a connecting-link between the old and the new work.

The treatment of all wall surfaces above this string will also follow that of the present Council House with columns and pilasters and entablature.

The flat dome is mainly an æsthetic feature, but it has been felt that some central treatment of this kind is requisite on the Congreve-street front. It will in no way damage the lighting of the galleries, being too far north-westwards and of no great height."

Books.

Apollo: an Illustrated Manual of the History of Art Through all Ages. By S. REINACH, Member of the Institute of France. Translated by FLORENCE SIMMONDS. (London: W. Heinemann. 1907.)

THIS comprehensive little treatise consists in the main of lectures delivered by M. Reinach at the Ecole du Louvre in 1902 and 1903. The whole has been gone over and revised by the author for this edition, which has been very well translated by Miss Simmonds. There are 600 illustrations, very small, as was necessarily the case to keep the book within a small size and price, but sufficient to explain the text and give a fair idea of the character of the works of art described.

So much for the contents and fashion of the book. As for the execution, we have nothing for it but praise. To give an all-round historical and critical summary of so vast a subject within the compass of a small book of course implies a very concise style and the packing of a good deal of information into very short sentences. But M. Reinach's critical faculty is excellent; he has been able to seize upon the salient points in the history and development of art and to direct the mind of a young reader (for this is essentially a book for the young) to a right judgment on art and artists. He has added to each chapter, moreover, a tolerably extensive bibliography, directing the reader to works in which he will find special portions of the subject expounded at greater length and detail.

If it is desired to give to intelligent boys and girls a book which will give them a first general idea of what is the meaning of art as a whole, and what have been its achievements in different countries and in different ages, we can imagine nothing better suited for such a purpose than this small but comprehensive treatise by a writer who thoroughly understands his subject.

Embroidery and Tapestry Weaving. By Mrs. A. H. CHRISTIE. The Arts and Crafts Series of Technical Handbooks. (London: John Hogg. 1906.)

MRS. CHRISTIE calls her book "a practical text-book of design and workmanship." She makes us feel that in its composition she was actuated not so much by the desire of compiling a technical manual as of voicing the reverence she evidently feels for her craft. To quote from Professor Lethaby's instructive preface: "Needlework . . . was once a splendid art, in which English workers were especially famous, so that early in the XIIIth century vestments embroidered in England were eagerly accepted at Rome . . . and known over Europe as 'English work.'" The English have so often been reproached by other European nations for their stolid lack of artistic feeling that it is gratifying to hear of an artistic craft in which the English excelled both as designers and workers. A finished piece of tapestry is the concrete expression of artistic thought, and as such ought certainly to rank in public regard next, at all events, to painting, more especially so as it may be called a native art. Yet to most of us this tapestry is a forgotten art; the mere word has a mediæval ring about it, and that it is actually a living art, none the less vigorous because unappreciated, not one in a thousand realises. This is to be regretted. Technically Mrs. Christie's book is admirable. There is a concise and simple directness about her style which makes it especially easy for the student to grasp the explanation of the various stitches and designs, while a number of excellent diagrams further simplify the task. At the end are some beautifully-printed illustrations of old-time work; amongst these perhaps the most interesting are Plate VII., an embroidered wool-work curtain (XVIIth or XVIIIth century), and Plate XI., an example of Persian embroidery. An embroidered altar frontal designed by Mr. Philip Webb and executed by Miss May Morris furnishes a pleasing example of modern work. For the rest, the letterpress is good, the index comprehensive. Mrs. Christie is to be congratulated on her work, which may be commended at once to the student and connoisseur.

Painters' Colours, Oils, and Varnishes. By G. H. HURST, F.C.S. Fourth edition, revised and enlarged. (London: Charles Griffin & Co., Ltd. 1906.)

THIS fourth edition of the manual of the late Mr. G. H. Hurst contains such additions as were required to bring the volume up to date, but no change has been made in the plan of the book. The chapter on "Lakes" has been enlarged, and due notice has been taken of the extending practice of using coal-tar dyes in place of natural colouring matters in the preparation of lakes.

According to the author, "the aniline or coal-tar lakes are not true lakes, although they are prepared by precipitating a coal-tar colour with a suitable precipitating agent; they always contain another substance in addition to the lake proper, which is added for the double purpose of increasing the covering power or body of the lake as well as, in some cases, of modifying or toning down the shade. At the same time, it reduces the cost of the lake, and brings it within the purchasing power of painters for use in common decorative work."

Several of the many different methods of manufacturing white lead are described, but the old Dutch method still ranks as the best and most important. The total number of white lead factories in Great Britain is forty-six, and of these forty-two use the Dutch method.

The manual is not a deeply scientific work, but it is quite free from the reproach of being merely a collection of recipes. It shows how and of what materials modern paints and varnishes are made, and it also discusses, in its simplest aspects, the science of the subject under treatment. The book may with advantage be added to the office libraries of architects and builders. The information it contains concerning the adulteration of linseed oil, turpentine, and the various pigments is especially noteworthy.

The "International" Pricing Tables and Percentage Reckoner. By GORDON SIMS and J. GALL INGLIS. (London: Gall & Inglis.)

THE decimal system is bound to become universal sooner or later, and the way is being gradually paved for its general adoption in this country by the spread of education and the necessities of an ever-extending international trade. But such revolutionary changes cannot be forced upon a nation—as President Roosevelt has learned in the much smaller matter of spelling. Still, we are moving, one large commercial concern at least having taken the bull by the horns, and it would be instructive to have Messrs. Kynoch's report of the result of their bold experiment after a year's trial.

To the increasingly large number of employers who find it necessary to use the decimal system side by side with the general but more cumbrous method, such "time-savers" as the handy volume before us will no doubt be welcomed. It consists of a mass of figures, worked out into elaborate tables, for showing at a glance results which would otherwise require long and intricate calculation. The necessary addition of percentage to cost price which will provide for net and gross profits, etc., together with highly detailed percentage tables in both British and decimal currency, and other similar calculations, should render the work very serviceable to manufacturers and business men generally on both sides of the Atlantic. The great desideratum in such works of reference is infallibility, and confidence is inspired by the compilers' assurance that everything possible in the way of checking and proof-reading has been carefully carried out.

London Building Acts (Amendment) Act, 1905. By BERNARD C. MOLLOY, Barrister. (London: The *Estates Gazette*, Ltd.)

IT is sufficient to say of this publication that it is a print of the new Act with an introductory *précis* and an index. The Act is chiefly concerned with the means of escape in case of fire in new and existing buildings. The book will certainly be found useful.

BOOKS RECEIVED.

LOCKWOOD'S BUILDER'S, ARCHITECT'S, CONTRACTOR'S, AND ENGINEER'S PRICE BOOK: 1907. Edited by F. T. W. Miller, A.R.I.B.A. (Crosby Lockwood & Son. 4s.)

PROCEEDINGS OF THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS. Vol. XXXII. 1905-1906. Edited by Thomas Cole. (E. & F. N. Spon.)

SEWAGE AND BACTERIAL PURIFICATION OF SEWAGE. By Samuel Rideal, D.Sc. Third Edition. (The Sanitary Publishing Company. 16s.)

APOLLO: AN ILLUSTRATED MANUAL OF THE HISTORY OF ART THROUGHOUT THE AGES. By S. Remach, member of the Institute of France. Translated by Florence Simmonds. New Edition. (W. Heinemann. 6s.)

PAINT AND COLOUR MIXING: A PRACTICAL HANDBOOK. By A. Seymour Jennings. Third Edition, re-written and enlarged. (E. & F. N. Spon. 5s.)

BOARD SCHOOL, MINNIGAFF, GALLOWAY.—A new school has been erected by the School Board of Minnigaff in Minnigaff Village. The school has been built at a cost of 1,442*l.*, and is built of whinstone, with freestone dressings, heavy pavilion roofs, slated with best Burlington slates and red terra-cotta ridge tiling. The accommodation consists of a schoolroom to hold sixty pupils and two classrooms to hold ninety. The architect was Mr. M'Gregor, Castle Douglas.

Correspondence.

ZODIACS IN PAGAN TEMPLES.

SIR,—The instances already given are probably sufficient to show that the zodiac in Christian churches was not an accidental circumstance, but was considered as an appropriate symbolical arrangement.

This is confirmed by the fact that the zodiac is found also, analogously, in pagan temples, as the following examples sufficiently illustrate, and of course there may be others.

Egyptian Temples.

1. On the ceiling of the Ramesseiom (Memnonium), having the figure of a god under each sign. Roman period. (Sharpe: "History of Egypt," i. 86. Lockyer: "Dawn of Astronomy," 143. Murray: "Egypt." Osburn: "Antiquities of Egypt.")

2. A rectangular planisphere is on the roof of the temple of Isis at Dendera. Engraved in Lockyer, 137.

3. In the temple of Chimmin (Khem), or Chem (Pan), at Pantopolis, in the Thebaid. (Rees: "Cyclopædia," *art*, Pan.)

4. In the temple at Contra Laton, beyond Thebes.

5. A large circular sandstone planisphere was cut out by Lelorrain in 1821, from the ceiling of a chamber of initiation, on the roof of the temple of Isis at Tentyra, near Denderah, and is now in the hall of the Bibl othèque Nationale, Paris. About B.C. 46. A cast of it is in the Louvre. A marble facsimile is in the Fitzwilliam Museum, Cambridge. It is engraved by Denon ("Description de l'Egypte," iii., iv.), Halma ("Examen et Explication du Zodiaque de Dendera"), Cole ("Circular Zodiac of Tentyra"), Knight ("Penny Cyclopædia"), Rolleston ("Mazzaroth"), Hamilton ("Egyptiaca, 158), Drummond ("Œdipus Judaicus").

6. On the ceiling of the portico of the temple of Isis at Esneh. Engraved in Denon; Panckoucke "Description de l'Egypte"); Halma; Drummond; Osburn; Rolleston; and Lockyer.

7. In a temple at Deir, near Esne. Halls ("Life of Salt," ii. 183).

8. In one at E'Dayr, 1,800 years old. *N. and Q.*, 4 S. vii. 65.

9. In a ruined temple, near Esneh. (Blackie: "Encyclopædia," v. 93.)

Palmyrian Temple.

10. On the white marble ceiling of the temple of the sun, in a circle, with busts of seven planetary deities, in the naos. Engraved in Wood ("Ruins of Palmyra," xix.), and Wright ("Palmyra and Zenobia," 67).

Chinese Temple.

11. On tablets on the middle terrace of an astronomical temple at Pekin. (Lockyer, 88.)

Mexican Temple.

12. On a block of basalt, from the foundations of the temple of Mixitili in Mexico, 1512. Engraved in Humboldt ("Researches"), and Bollaert (*Intellectual Observer*, August, 1865). A cast of it is in the Trocadero, Paris, Salle B.

Indian Temple.

13. On the ceiling of a pagoda temple in a tank, at Verdapettah (Teppecolum), near Madurah, Cape Comorin, S. India: square. Engraved in the *Philosophical Transactions*, 1772; *Gent. Mag.*, 1773; Rees *Cyclopædia*; Jamieson: "Celestial Atlas"; and Drummond.

Roman Temples.

14. Valerius Flaccus (*Argonauticon*, v. 417) describes an orrery, with the planets and constellations, in a temple of Phœbus, B.C. 184. (Spence: "Polymetis.")

15. The chair of S. Peter, in S. Peter's, Rome, has the signs on it in front. (Bower: "Lives of the Popes." Higgins: "Anacalypsis," i. 691.) The *Catholic Fireside*, No. 666, says they are of the IXth century. It is engraved in Primmer: "In Rome," 96.

16. In the Villa Borghesi, Rome, is the marble plinth of a temple candelabrum, with the signs on it. (Forsyth: "Italy," 224.)

17. Round the basin of a marble altar, with busts of the planetary deities. In the Louvre, Paris.

Mithraic Temples.

18. At the end of each Mithræum, against the wall, was a Mithraic tablet, sculptured with Mithra slaying the bull, etc. Of the many tablets discovered five of them bear the zodiac These are in the Museums at Wiesbaden, Osterburken, and Heddernheim, and one was found in London.

23. Between the folds of a snake, wound round the body of a statue of Mithra. In Arles Museum. (Blessington: "Idler in France," i. 35.)

24. Around a statue of Mithraic Kronos, on a vase of fire. At Modena, a basrelief. Engraved in *Rev. Arch.*, 1902. McCormac: "Mysteries of Mithra," Fig. 49. The *Open Court*, June, 1902.

25. Signs on the serpent round a marble sculpture of Mithra. In the Uffizi Palace, Florence. In Sala Inscrizione, No. 284.

26. Statue of Mithra, with serpent and signs. Engraved in Montfaucon: "Antiquité Explique," I., ii. 378.

Mithraic Tablets.

27. In the above instances the conventional zodiac surrounds the tablet proper, forming no part of it, and I have only found those five instances (No. 18). But from a close study of all the tablets in books and foreign museums (no English museum I know of has one), I became convinced that all the figures on the tablets are zodiacal, and are, in fact, the primitive twelve signs, and thirty-six decans, treated as real beings. The following figures occur, some on all, others on some, of the extant tablets:—Bull (Taurus), scorpion (Scorpio), lion (Leo), corn ears (Spica in Virgo), twin youths (Gemini), woman (Virgo), vase (Aquarius), crab (Cancer), bow, quiver, arrow (Sagittarius), fish-goat (Capricornus), seven stars (Pleiades in Taurus), sheep (Aries), fishes (Pisces). Besides these signs, the following decans are found on the tablets:—Mithra (Perseus), holding dagger (Herpe), dog (Sirius), dog (Procyon), serpent (Draco), eagle (Aquila), crow (Corvus), vase (Crater), altar (Ara), man with serpents (Ophiuchus), arrow (Sagitta), star (Coma), man with sceptre (Cepheus), dove (Turdus solitarius), dolphin (Delphinus), two stars (Castor and Pollux), winged horse (Pegasus), swan (Cygnus), wolf (Lynx), whip (held by Boötes), sickle (held by Bootes), man with snake and rod (Hercules), bear (Ursa Major), river (Eridanus), [cross (Crux Australis), palm (Palma in Virgo). Thus eleven out of the twelve signs, and twenty-six out of the thirty-six decans, are found on the extant Mithraic tablets.

Engravings of many Mithraic tablets will be found in Cumont ("Textes et monuments figurés relatifs aux mystères de Mithra") McCormack ("Mysteries of Mithra"); and one or more in Drummond; Maurice ("Indian Antiquities"); *The Open Court*, 1902; Sir W. Jones ("Works"); *Archæological Journal* xlviii.; Smith ("Bible Dictionary"); Calmet ("Bible Dictionary," Persia), etc. D. J.

SUNDERLAND THEATRE TESTS.

SIR,—In your last week's issue you give prominent notice of the new King's Theatre, Sunderland, with particulars of the testing and deflections of the reinforced concrete gallery. The testing, it is said, was done by placing a load of 182 lb. *on each seat*, giving a total load of 81 tons for a 60 ft. span gallery. A gallery seat may be taken at about 2 ft. by 1 ft. 6 in., or, say, 3 sq. ft., the test load would therefore be equal to about 60 lb. per square foot, and practically a dead load. The question I should like to ask is whether this was considered a sufficient and satisfactory test by our local authorities? I have recently designed some steel work for theatre galleries, for which I was compelled to take 200 lb. for the live load per square foot; and in other cases have had a hard struggle to get a load of 1½ cwt. per square foot passed.

If reinforced concrete structures are designed for these light loads, it is not surprising that they work out apparently more economical than the steel framed and concrete structures.

With regard to the cantilever test, I fail to see where the severity comes in. With its greater depth compared to its projection, and the load 1 cwt. per square foot dead, it certainly would not be unbalanced. No doubt this gallery is an interesting structure, and considering the interest taken in these public structures further particulars of the official loads and tests would be instructive. F. W. J.

NOTES BY A CLERK OF WORKS.

SIR,—These are very interesting and very informing, but my impression is that the clerk of works of the future will be simply an inspector. He will be selected for his ability as a keen judge of materials and workmanship acquired by many previous years of hard work in another capacity, and by general intelligence, and, above all, for his integrity.

He will as a matter of course make plenty of notes, but his actual "measuring up" will be a very small affair, as that will be done by the surveyor for the intermediate and final accounts.

I have known eminent architects who would not allow their clerk of works to write a letter to anybody except themselves; and that is, I find, becoming the rule. CLERK OF WORKS.

ARCHITECTURAL ASSOCIATION'S THIRD ANNUAL STUDENTS' SMOKING CONCERT.—A special feature of this year's concert, to be held a the Georgian Hall of the Gaiety Restaurant, on March 1, will be an attempt to revive the Architectural Association's plays by producing a short, new, and original musical extravaganza. It has also been arranged to hold a ladies' night and dress rehearsal of the play on the previous evening at the same place. Particulars can be obtained from Mr. T. W. Watkins, 28, Elm Park-mansions, S.W., and from the secretary of the Association, 18, Tufton-street, S.W.

The Student's Column.

III.—ELECTRIC LIGHTING AND HEATING.

Conductors — Wire Gauges — Cables—Volume Resistivity—Mass Resistivity—Temperature Coefficient—Substitutes for Copper—Resistance Metals—P.D. Drop.

CONDUCTORS.—In order to convey the electric power generated in the dynamo at the central station to the lamp, it has to be connected with the lamp by suitable conductors of electricity. If the resistance of the conductors be too high, a considerable fraction of the power generated will be expended in heating them. In order to make this loss small, it is necessary to employ conductors the resistance of which, compared with the resistance of the lamps and consuming devices, is extremely small. For the street mains, thick copper conductors, built up of strands of wire and covered with layers of india-rubber, jute, tape, and other insulating materials, are employed. As a protection against moisture the whole cable is sometimes sheathed with lead, and, as a mechanical protection, the lead is sometimes surrounded by galvanised-iron wires or by steel ribbons. The size of the cable required depends on the current it has to carry, and this can be easily calculated when the load is known. If, for example, the current was 200 amperes, and if 800 amperes per square inch of cross-section was the minimum permissible, the section would have to be 0·25 of a square inch at least. The sizes of the mains required inside buildings are calculated in the same way.

The material practically universally employed as the conductor of the current is copper. The cross-section of a wire forming one of the strands of a cable is circular, and so its area can be readily found when its diameter is known. For example, if the diameter were d inches, the area of the cross-section is $0{\cdot}7854d^2$ sq. in. Instead of measuring the area of the cross-section in square inches, manufacturers often measure it in "circular mils." The circular mil is the area of a circle whose diameter is one mil—that is, the thousandth part of an inch. If, therefore, the diameter d be measured in mils, the area of the cross-section is simply d^2 circular mils.

Wire Gauges.—The sizes of wires are governed by the gauge used by the manufacture. In this country the legal standard is the Standard Wire Gauge (S.W.G.), in America the Brown & Sharp Gauge (B. & S.) is used, and on the Continent the diameters of wires are multiples and submultiples of the millimetre. A No. 18 (S.W.G.) wire, for instance, has a diameter of 48 mils (1·21 mm.), and a No. 18 (B. & S.) has a diameter of 40·3 mils (1·02 mm.). In addition, the Birmingham Wire Gauge (B.W.G.) is also used in this country. The numbers in the English Wire Gauges are not connected with the diameters of the wires by any simple relation. In the B. & S. Gauge, however, the diameters form a series of numbers in geometrical progression, the common ratio being 1·123. In this gauge No. 36 wire has a diameter of 5 mils, No. 35 a diameter of $5 \times 1{\cdot}123$ mils—that is, 5·615 mils, etc. The following table shows the comparative values of a few of the wires in the three gauges:—

—	Diameter in Mils.		
No. of Wire.	S.W.G.	B.W.G.	B. & S.
0000	400	454	460
0	324	340	325
6	192	203	162
12	104	109	80
18	48	49	40
24	22	22	20
30	12	12	10
36	5	4	5
40	3	—	3

In order to convert mils to millimetres we multiply by 0·0254.

Cables.—Heavy conductors for carrying large currents are called cables, and usually consist of many strands of wire forming the core of the cable, which is suitably covered with insulating material. It is cheaper to use a solid cylindrical conductor of the

required cross-sectional area, but a stranded cable is much more flexible. Hence, in England, wires whose diameters are greater than the diameter of a No. 16 wire (64 mils) are very rarely employed for cables. In order to make the strands of the core of a cable bind together, a "lay" of about one in twenty is given to all the strands with the exception of the central one—that is, every strand makes a complete turn round the central one in a distance parallel to the central wire equal to twenty times the diameter of the helix of which the strand is a portion. For this reason the weight per unit length of a cable containing n strands is always greater than n times the weight of a unit length of a strand. Unless the strands be very tightly packed together the electric currents flow along the strands, and thus the resistance of unit length of the cable is greater than R/n, where R is the resistance of unit length of a strand. The Engineering Standards Committee have published tables giving the standard sizes of stranded conductors for electric supply. They publish three tables, one for conductors of large cross-sectional area, one for intermediate sizes, and one for conductors of small size. For instance, if a very large cable having a cross-sectional area of 1 sq. in. were wanted, we could order either a 91/0·118 or a 127/0·101 cable. The first of these cables would consist of ninety-one strands of wire, the diameter of each strand being 118 mils. The resistance of 1,000 yds. of this cable at 60° F. would be 0·0246 of an ohm, and its weight per mile would be 20,650 lb. As this is greater than 9 tons per mile, and copper costs more than 100*l.* per ton, it will be seen that the copper in an electric-lighting network represents a large amount of capital. The small cables are generally expressed by the number and gauge of the strands. A 3/18 cable, for example, would have three stands of No. 18 wire, it would have a resistance of about 4·5 ohms per 1,000 yds., and a weight of about 113 lb.

Volume Resistivity.—We have now to consider how the resistance of a conductor varies with its linear dimensions. If the cross-sectional area of a wire is constant, it is obvious, by Ohm's law, that doubling its length doubles its resistance, for we have two equal resistances in series. Similarly, if we keep the length constant and double the cross-sectional area, we halve the resistance, for the resistance is equal to that of two equal wires in parallel. Provided, therefore, that the temperature and physical state of the metal remain constant, we see that the resistance R of a conductor of length l cms. and cross-sectional area A sq. cms. varies directly as l and inversely as A. In algebraical notation, therefore, we may write

$$R = \rho\, l/A,$$

where ρ (the Greek letter rho) is a constant. This constant is defined to be the volume resistivity of the metal at the given temperature.

The volume resistivity is measured in microhms—that is, millionths of an ohm. By putting l and A equal to unity in the above formula we see that the volume resistivity may be defined as the resistance in microhms of a cubic centimetre of the metal to a flow of current parallel to an edge from one face to the other. For high conductivity copper ρ varies between 1·68 and 1·74 at 15·6° C. (60° F.), which is usually taken as the standard temperature.

When the mechanical strength of the wire has to be considerable, as, for instance, for overhead wires, hard-drawn copper is employed. For underground cables, however, mechanical strength is of secondary importance in comparison with high conductivity and flexibility. Hence, soft annealed copper is employed. A hard-drawn copper wire is defined to be one which will not elongate more than 1 per cent. of its length without fracture.

In making calculations in connexion with copper wire, it is customary to assume that a cubic foot of copper at 60° F. weighs 555 lb. exactly. Its mass per cubic centimetre at this temperature would therefore be 8·89 grammes, and this corresponds to a specific gravity of 8·90 at 0° C. As a matter of fact, the specific gravity of high conductivity copper varies between 8·88 and 8·95. Hence, this assumption, although extremely convenient in practice, introduces an uncertainty of about the half of 1 per cent. into the calculated results.

The standard volume resistivity for annealed high conductivity commercial copper is 1·696 microhms at 60° F., and for hard-drawn copper 1·731 microhms. When the wires are insulated with vulcanised rubber it is necessary that they should be tinned—that is, the copper should be covered with a thin coating of tin so as to prevent the sulphur in the insulation from attacking it. This slightly increases the resistance as calculated from the linear dimensions on the assumption that the wire is pure copper. It is customary to add on 1 per cent. to the calculated resistance so as to allow roughly for the increased resistance due to the tin.

When the dimensions of the wires are given in British units, it is more convenient to express ρ in microhms per cubic inch. For annealed copper the value of ρ at 60° F. is now 1·696/2·54—that is, 0·6677 microhms per cubic inch; and the value of ρ for hard-drawn copper is 0·6815. In everyday calculations it is customary to take 0·67 as the resistivity of annealed, and 0·68 as the resistivity of hard-drawn, copper.

Suppose we have to find the resistance at 60°F. of a mile of hard-drawn copper wire 0·1 of a square inch in cross-sectional area. We have

$$R = \rho\, l/A = 0{\cdot}68 \times 1760 \times 36/0{\cdot}1 \text{ microhms} = 0{\cdot}43 \text{ of an ohm.}$$

If the cross-sectional area had been one-tenth of this the resistance would be 4·3 ohms, and if it had been 1 sq. in. the resistance would be 0·043 ohm per mile.

As a rule, however, an approximate value of the resistance of a wire can be most readily found from the manufacturers' catalogue. For instance, we find from the catalogue that the resistance of 1 yd. of cable containing seven strands of No. 22 wire (7/22) is 0·0056 of an ohm. Hence, the resistance of a length of l yards will be $l \times 0{\cdot}0056$ ohm.

Mass Resistivity.—For some purposes it is more convenient to express the resistivity of a metal in terms of its length and mass. The mass resistivity of a metal is the resistance in ohms at 60° F. of a metre of the metal weighing 1 gramme. We shall denote the mass resistivity of a metal by the Greek letter sigma (σ). The value of σ, which is taken as the standard of annealed high conductivity commercial copper, is 0·1508, and for hard-drawn copper 0·1539. These standards are sometimes called Matthiessen's Standards.

If the mass of the wire be in grammes, and its length 1 metre, it follows by Ohm's law that the resistance R^1 is given by

$$R^1 = \tau/m.$$

If the length of the wire be l metres, its mass M will equal m l, and its resistance R is given by

$$R = l\, R^1 = \sigma\, l/m = \sigma\, l^2/M.$$

This formula is useful in practice. For example, suppose we wish to find the resistance R at 60° F. of 12·1 metres of annealed copper wire, the weight of the copper wire being 44 grammes. We find at once by the formula that

$$R = \sigma\, l^2/M = 0{\cdot}1508\ (12{\cdot}1)^2/44 = 0{\cdot}5 \text{ ohm, nearly.}$$

It follows also that the resistance σ^1 of a yard of annealed copper wire weighing one pound is given by

$$\sigma^1 = 0{\cdot}1508\ \frac{(36 \times 2{\cdot}54)^2}{453{\cdot}6\ (100)^2} = 0{\cdot}0002780 \text{ ohm,}$$

and for hard-drawn copper

$$\sigma^1 = 0{\cdot}0002837 \text{ ohm.}$$

Temperature Coefficient.—The resistance of a copper wire increases very appreciably with the temperature. It is found by experiment that the increase in the resistance of a wire is very approximately proportional to the increase of the temperature. It is customary to assume that this increase of resistance is 0·00428 per degree C. times the resistance at 0° C.

If ρ_0, σ_0 and ρ_t, σ_t be the volume and mass resistivities at 0° and t° C. respectively, we have

$$\rho_t = \rho_0\,(1 + \alpha t) \text{ and } \sigma_t = \sigma_0\,(1 + \alpha t),$$

where $\alpha = 0{\cdot}00428$.

—To find the value of ρ_0 and σ_0 for annealed copper we make $t = 15{\cdot}6$° C. in the above formulæ and write $\rho_t = 1{\cdot}696$ and $\sigma_t = 0{\cdot}1508$. Thus, we have

$\rho_0 = 1{\cdot}696/(1 + 0{\cdot}00428 \times 15{\cdot}6) = 1{\cdot}590$ microhms, and

$\sigma_0 = 0{\cdot}1508/(1 + 0{\cdot}00428 \times 15{\cdot}6) = 0{\cdot}1414$ ohm.

Similarly, for hard-drawn copper, we have

$\rho_0 = 1{\cdot}731/(1 + 0{\cdot}00428 \times 15{\cdot}6) = 1{\cdot}623$ microhms, and

$\sigma_0 = 0{\cdot}1539/(1 + 0{\cdot}00428 \times 15{\cdot}6) = 0{\cdot}1443$ ohm.

A knowledge of the value of the temperature coefficient is useful in enabling us to find the rise of temperature of a coil. We measure the resistance R of the coil at the temperature of the room T before the current flows. We then measure it immediately afterwards. Let us suppose that the final value is R^1 and that the rise of temperature is t° C. We have

$$R = R_0\,[1 + 0{\cdot}00428\ T],$$

and $$R^1 = R_0\,[1 + 0{\cdot}00428\ (T + t)],$$

where R_0 is the resistance of the coil at 0° C. Hence dividing one equation by the other so as to eliminate R_0, and solving for t, we find after a little reduction that

$$t = (234 + T)\,(R^1/R - 1),$$

very approximately.

As an example, let us suppose that the resistance of the field-magnet windings of a dynamo when at the temperature of the room 20° C. is 72·3 ohms, and that after a run of twelve hours on a load the resistance is 80·3 ohms. Then by the formula the average rise of temperature t of the field-magnet coils is given by

$$t = (234 + 20)\,(80{\cdot}3/72{\cdot}3 - 1) = 2032/72{\cdot}3 = 28{\cdot}1° \text{ C.}$$

It has to be noticed, however, that we have made the assumption that the temperature coefficience is 0·00428. This assumption has the sanction of the Engineering Standards Committee, but the number given seems to be too high. In America the accepted value of α is 0·0042, and on the Continent 0·004. The true value also is sometimes as low as 0·0038. The error in the calculated rise may thus be 10 per cent. owing to an erroneous value being taken for the temperature coefficient. As a dynamo is rated according to its temperature rise, this uncertainty introduced into the method of calculating the mean temperature rise of coils is a frequent cause of annoyance in practice.

Substitutes for Copper.—Owing to recent rises in the price of copper the value of other materials for electric conductors has to be considered. The following table gives the relative values of the conductivity of some of the more suitable methods:—

Metal.	Conductivity.	Specific Gravity.	Breaking Stress.
Aluminium	56	2·6	25,000
Copper, annealed ...	100	8·9	30,000
Copper, hard-drawn..	98	8·9	65,000
Galvanised iron	14	7·7	60,000
Silicon bronze	81	8·9	76,000
Steel.....	10	8·0	130,000

The numbers in the last column give the breaking stress in pounds per square inch. It will be seen that aluminium is the most likely metal to come into extensive use. To illustrate this, let us consider a numerical example.

The resistance of a hard-drawn copper wire, one-tenth of a square inch in cross-section and one mile long, is about 0·43 of an ohm at 60° F. The resistance of a mile of aluminium wire of the same weight is $0{\cdot}43 \times (100/56) \times (2{\cdot}6/8{\cdot}9) = 0{\cdot}43 \times 0{\cdot}5217 = 0{\cdot}2237$ of an ohm nearly. Hence, the resistance of an equal weight of aluminium wire would be little more than half that of copper wire. As metals are purchased by the pound it will be seen that weight and not volume is the proper basis for comparison, and this is the basis we have chosen.

Resistance Metals.—When the pressure of a supply circuit is too high, it is sometimes necessary to put a coil of some high-resistance metal in series with the consuming device so that the pressure required to send current through it is subtracted from that between the supply mains, and the required pressure is produced at the terminals of the device. The metals usually employed are iron, platinoid, German silver, manganin, and other special alloys. German silver is an alloy of copper, zinc, and nickel, and its resistivity is about twelve times that of copper. Platinoid is German silver alloyed with a little

tungsten, and its resistivity is about sixteen times greater than that of copper. Manganin is an alloy of manganese, nickel, and copper, with a resistivity twenty-four times that of copper. It is extensively used for making standard resistances for testing purposes, as its temperature coefficient is practically zero.

P.D. Drop.—The electric pressure required to drive a given current through the mains is called the potential drop in the mains. We have already seen that the resistance of a mile of copper conductor, 1 sq. in. in cross-section is 0·043 ohm at 60° F. Hence, by Ohm's law the current required to drive 1,000 amperes through it would be 1,000 × 0·043—that is, 43 volts. Hence, if the power-station be connected with a consumer at a distance of half a mile by a main of this size, 43 volts will be required for the mains, when the current is 1,000 amperes. Hence, if the pressure at the power-station be 263 volts, the pressure at the consumer's switchboard will be 263 when he is taking no current, but will only be 220 when he is taking 1,000 amperes. The difference in the pressures, 263 − 220 = 43, is required to overcome the resistance of the mains. This fall of the pressure is generally referred to as the P.D. (potential difference) drop.

As another example, let us suppose that there are two wires, each 100 yds. long, joining the switchboard and the farthest distributing-board in an installation. If the resistance of each wire be 0·001 ohm per yard, the resistance of the two in series will be 0·2 ohm. Hence, if the load be 10 amperes, the pressure will be 0·2 × 10—that is, 2 volts less at the distributing-board than at the main switchboard.

MANCHESTER BUILDING BY-LAWS.

At the last meeting of the Manchester City Council Mr. Alderman Wilson proposed the adoption of the new by-laws with respect to new streets and buildings as recommended by the Improvements and Buildings Committee. Their consideration, Mr. Alderman Wilson said, had received the serious attention of the committee for nearly three years, and the time had not been wasted. No more hygienic property could be built than that which would be built under these new by-laws, which, if they did not tend to bring in a little more money in the shape of rent, would bring health and strength to the people, which was the greatest asset we had.—Mr. J. Royle seconded the motion. The committee had, he said, with great devotion considered the matter from all points. In the past men had made money by putting up a large number of houses on a small quantity of land. If the Council did not now make very considerable alterations in their by-laws which related to the building of cottage property those who followed them in that Council would be under the painful necessity of insisting that owners of property which the Council were allowing to be erected should make necessary improvements, or, as they were doing to-day, have to pay half the cost themselves. However hard it might be upon the owners of property, it was only right that they should face the difficulty and at once. If it was really impossible to build remunerative property in consequence of the land being so dear, then the price of land would have to come down. Come down it would sooner or later, for the restrictions which had been placed on land in the past would be the next great question in the future. They might not live to see it, but he had considerable hope that the matter would be dealt with before long.—On the motion of Mr. Abbott the Council adjourned, the member who seconded the motion expressing the view that members should have time to consider these important by-laws.

The proposed amendments and additions to the by-laws as to new streets and buildings, etc., have been issued in draft form.

The first series of amendments deal with the interpretation of terms of frequent occurrence in the by-laws. The expression "main street" is defined as meaning a street which either alone or in combination with another main street affords or will afford direct communication for vehicular traffic between two main roads or between two populous parts of the city or of the city and an adjoining urban district. A secondary street is one which does not fulfil this purpose, and in the new by-laws relating to streets it is provided that new main streets shall be 54 ft. wide and new secondary streets 42 ft. wide in Withington and 36 ft. in the remainder of the city. A back street is defined as one which does not form the principal approach to any premises, but is used mainly for the purpose of removing refuse from such premises, and a cross street as one which connects a main or secondary street with a back street. It is provided in the amendments to the by-laws that a new cross street shall have a width of at least 12 ft.

The amendments to the by-laws regulating building provide for the covering of foundations with good cement concrete at least 6 in. thick and the asphalting and cementing of the whole ground surfaces within the external walls of domestic buildings, and there are a number of amendments regulating the height, length, and construction of walls. The cellars of new dwelling-houses are to be laid with a bed of cement concrete not less than 4 in. thick.

The new provisions in regard to open spaces in front of and behind new buildings vary according as the building is in Manchester, Moss Side, and Withington, and are set out with great minuteness. They are followed by a provision with regard to open spaces generally, which provides that every person who shall erect a new dwelling-house shall provide open spaces about it which, including the site and one-half in width of the adjoining streets co-extensive with it, shall be of an aggregate area of not less than 200 superficial sq. yds. Where, however, the detailed by-laws are more exacting the above provision is not to be read in derogation of them. Windows in habitable rooms are to be equal to one-tenth of the poor area, and there are provisions regulating the space which windows are to open, and securing that such aperture shall be at such a distance from the ceiling of the room as shall secure proper ventilation according to modern ideas. Staircases in domestic buildings are to have a tread of not less than 9 in. in width with a rise of not more than 8 in. for each step, and are to be properly ventilated and lighted, and where a principal staircase is to be used by several families in common it is to be adequately ventilated upon every story.

In public buildings public staircases are to be not less than 4 ft. in width and to have a suitable handrail on each side. The width of the staircase is to increase with the size of the building, and in the case of larger buildings there are provisions for landings at each flight and prohibition of winder steps. Under the heading of drainage it is provided that drains shall be laid in concrete. —*Manchester Guardian.*

MODEL COTTAGES EXHIBITION, NEWCASTLE-ON-TYNE.

A REPORT has been presented to the Newcastle City Council by the Housing of the Poor Committee recommending the erection of cottages on the Walker estate. The report is as follows :—

Arrangements are being made, under the auspices of the National Housing Reform Council, for a North of England Model Cottage Exhibition, to be held in 1907 on a portion of the Walker estate of the Corporation.

It has been arranged by the Estate and Property Committee to place at the disposal of the Model Cottage Exhibition Committee about sixteen acres of land on the north side of the Newcastle and Shields road, east of the railway bridge over Shields-road near Walker-gate, on which to erect about twelve houses per acre; each site to be leased from the Corporation for ninety-nine years, at the customary ground rent of 4d. per square yard per annum for the land occupied by buildings, and 1d. per square yard per annum for garden ground; the Corporation to provide the land required for streets, and to construct the streets, and the payment of street formation expenses to be spread over the first ten years of each lease if so desired. The Model Cottage Exhibition Committee plans for laying out the land are to be subject to the approval of the Corporation.

It has been arranged by the Model Cottage Exhibition Committee that three classes of cottages should be erected, namely :—

Class A.—Cottages to contain two bedrooms, large living room, and scullery. Each cottage to be supplied with a bath. The maximum price of this class of cottage has been fixed at 185*l.*; this to include architect's fees and builder's profits, but not cost of land or roads.

Class B.—Cottages to contain three bedrooms, large living room, and scullery. Each cottage to be supplied with a bath. The maximum price of this class of cottage has been fixed at 225*l.*; this to include architect's fees and builder's profits, but not cost of land or roads.

Class C.—Cottages to contain three bedrooms, parlour, large living room, and scullery. Each cottage to be supplied with a bath. The maximum price of this class of cottage has been fixed at 250*l.*; this to include architect's fees and builder's profits, but not cost of land or roads.

"The Housing of the Poor Committee having carefully considered the subject, recommend the Council to make application to the Local Government Board to sanction the appropriation of one acre of the Walker estate of the Corporation upon which to erect four cottages of each of the three classes above specified, subject to the payment of a ground rent of 4d. per square yard per annum for the land occupied by buildings, and 1d. per square yard per annum for garden ground; and also for the consent of the Board to a loan of 2,641*l.* to defray the cost of erecting the twelve cottages, and of 600*l.* to defray the street formation expenses. The Committee further recommend that, upon the receipt of the necessary consents of the Local Government Board, they be authorised to obtain tenders for the execution of the work, and report thereon to the Council."

Obituary.

MR. MULLINS.—We regret to announce the death, on January 9, at Shirley, Walberswick, of Mr. E. Roscoe Mullins, sculptor, of Shirley, Dollis-avenue, Finchley, N., aged 58 years. Of Mr. Mullins's sculptural works the following have been illustrated in the *Builder*—"Autolycus, Son of Mercury" (May 30, 1885); the sculpture for the pediment of the Harris Free Library and Museum at Preston (September 9, 1882; January 15, 1887; and January 21, 1888); sculpture for the offices in Birchin-lane, E.C., of the Commerical Banking Company of Sydney (April 16, 1887); "My Punishment is Greater than I can Bear" (June 13, 1896, two views), purchased for 300 guineas by the Glasgow Corporation for the Kelvin-grove Art Galleries; monumental statue, in bronze, to the late Rev. William Barnes, "the Dorsetshire Poet" (June 9, 1888); the frieze of camels, etc., on the façade of Messrs. Cardinal & Halford's premises, Nos. 108-110, High Holborn, W.C (September 12, 1903); a design for the Byron Memorial, the figure by Mr. Mullins, the architectural portion by Mr. H. H. Statham; a group of two girls, undraped (June 24, 1905); coats-of-arms for the panels, and the sculpture of the colossal groups at the two angles of the head offices in Leeds of the Yorkshire Banking Company (November 25, 1899); and the panels, etc., in the bays of the elevation of Nos. 46-8, Essex-street, Strand, for Messrs. Seeley & Co. (May 16, 1885). Mr. Mullins constantly exhibited his work at the New Gallery, the Grosvenor Gallery, and the Royal Academy exhibitions; amongst the works which he contributed we may mention the marble group, "Morn Waked by the 'Circling Hours,'" Grosvenor Gallery, 1887; "Life's a Jest," and "Euphorion," a group of a woman and a child, the New Gallery, 1889; a pedestal for a sun-dial, New Gallery, 1904; "Robin Goodfellow," New Gallery, 1905; and the central panel, together with the figure in relief and the heraldic shield of a memorial composition, New Gallery, 1906. His life-sized group of Isaac and Esau—"Bless me, even me also, O my father!" was exhibited in plaster in 1884, and in marble in 1904, at the Royal Academy. Mr. Mullins was the sculptor of busts of Mr Gladstone, of Dr. Martineau, 1900, and of the late Miss Frances Mary Buss, for the Camden School for Girls, 1897. In 1901 he executed an equestrian statue of his Highness the Thakore Sahib of Morvi, and a statue of Queen Victoria for his Highness; in 1904 he was commissioned to execute a large equestrian statue, to be cast in bronze, for India, of the late Prime Minister of Nepaul; he was also the sculptor of the group of figures upon the middle gable, and of the busts of Colonel French and Colonel Kennedy in the panels of the carriage-porch, of the Bombay, Baroda, and Central India Railway offices at Bombay. In the *Builder* of June 23, 1900, was printed a report of a paper upon "The Collaboration of the Architect, the Painter, and the Sculptor," which he read at a meeting of the General Architectural Congress, held in London in June of that year, under the auspices of the Royal Institute of British Architects.

MR. LEGG.—We regret to announce the death, on December 23, of Mr. Henry Simpson Legg formerly of Hampstead, in his seventy-sixth year. Mr. Legg was formerly member of the firm of Messrs. Legge & Son, of No. 56, Ludgate-hill, E.C. During many years he was District Surveyor for Mile End Old Town District, and architect and surveyor to Christ's Hospital, London. He was elected an Associate in 1859, and in 1873 a Fellow, of the Royal Institute of British Architects. Of Mr. Legg's architectural works the following have been illustrated in the *Builder*—Holy Trinity Church, South Hampstead (August 3, 1878); *Truth* Offices, Carteret-street, Queen Anne's-gate, Westminster (September 22, 1883); a house in Gainsborough-gardens, Hampstead (May 23, 1885); the "Empress Rooms," being the ball-room suite, together with the banqueting-hall, Royal Palace Hotel, Kensington High-street (November 13, 1897); and the East London Hospital for Children (May 19, 1877)—the last two named being by the firm. He was the architect of the extensive additions made seventeen years ago to the premises in Newcastle-on-Tyne of the Northern Assurance Company, and the Campden Buildings, Hampstead; also Messrs. Thrupp & Maberly's premises, Oxford-street (jointly with Mr. Arthur Kinder), and extensive additions to Lewisham Union (jointly with Mr. T. H. Bonner, A.R.I.B.A.) in 1885. The firm prepared the plans and designs of a block of residential flats in Green-street, Mayfair, and of St. Saviour's Church, Guildford, in 1897-8.

MR. GEORGE DOBSON.—Circumstances have prevented our noticing earlier the death of the

late Mr. George Dobson, builder and contractor, of Colchester, which took place on the 26th ult. Mr. Dobson, who was 77 at the time of his death, was head of the firm of Dobson & Son, of Colchester. Mr. Dobson was a native of Colchester, where he commenced business in 1854. Among the important buildings which he carried out may be mentioned the following: Under Sir G. G. Scott—St. Nicholas Church, Colchester; St. Margaret's Church, Westminster (internal restoration); under Mr. J. O. Scott—St. Albright's Church, Stanway, Essex; Talhouse Church, Norfolk; Buckingham Parish Church (internal); Newick Church, Sussex; additions to Buckhurst Hill Church; Coolhurst Church, Sussex. Under Mr. T. G. Jackson—Curdridge Church, Hants; restoration of Botley Hill House; Brasenose College, Oxford. Under the late Mr. James Brooks—St. Peter's Church, St. Leonard's-on-Sea; Parlmer Tower, Chislehurst Church. Under the late Mr. Luck—First portion of Ridley Hall, Cambridge. Under Messrs. J. E. K. & T. P. Cutts—St. Augustine's Church, Dovercourt (two portions); New Schools, Lee, Kent. Under H.M. Office of Works—New Post-office, Colchester; and additions to Newmarket and Brentwood Offices. A memorial service, held in Lion Walk Church, Colchester, (of which Mr. Dobson was the senior deacon), was very largely attended by his fellow townsmen, including all the members of the local Building Trades Association (of which he was president), the architectural profession, and merchants connected with the building trade.

General Building News.

RESTORATION OF THE WEST FRONT OF HEREFORD CATHEDRAL.—The Dean and Chapter have decided to proceed with the restoration of the west front of Hereford Cathedral. The west window, erected as a memorial of Queen Victoria, at a cost of 1,500*l.*, was unveiled in 1902. It was found necessary to carry on in accordance with Mr. Scott's design the further renewal of the west front, the pinnacles and the upper part of which had been rendered insecure by the earthquake of December, 1896, while the whole façade, as rebuilt by Wyatt in 1786, was unworthy of the rest of the Cathedral. The upper portion was completed and paid for at a cost of 3,000*l.* The next stage was the completion of the west end of the nave, involving the projection of two heavy buttresses, between which there was a handsome west portal with rich double doorways into the Cathedral. This work has been done at an additional cost of 4,500*l.*, and was dedicated by the Archbishop of Canterbury in 1904. The renewal of the west front of the north aisle, with the addition of turret and carved medallion, at an expenditure of 2,800*l.*, was completed at the end of 1905, and there remains to be completed the west front of the south aisle. The whole work is estimated to cost 14,800*l.* Operations have been suspended for a year, but have now been restarted.

THE RESTORATION OF SELBY ABBEY.—A meeting of the Executive Committee of the Selby Abbey Restoration Fund was held at Selby on the 11th inst. Tenders for the roofing and ceiling of the nave, north transept, and Latham Chapel, and the outer roofing and oak groining of the choir were opened, that of Mr. Thomas S. Ullathorne, of Selby, for 7,041*l.*, being accepted. There were ten tenders, and Mr. Ullathorne's was the lowest. Mr. Scott, the architect, informed the meeting that the roofing of the nave would be taken in hand at once, and that the choir exterior roof would be built from the east to west, as the damaged piers were repaired and strengthened to bear the superstructure. It was resolved to put a pitched roof on the north transept in accordance with the original roof of the building, and the tender of Mr. Ullathorne to rebuild the gable and erect the east and west turrets was accepted for 798*l.* 15s. 10d. On the advice of the architect the committee gave authority to proceed with the underpinning of the tower piers, which had sunk seriously and were a source of great weakness.

CHURCH REBUILDING, LLANELLY.—The old parish church of Llanelly, which has been rebuilt, was re-opened on the 8th inst. by the Lord Bishop of the diocese. The rebuilding has been carried out from plans by Mr. E. Bruce Vaughan, architect, Cardiff, the contractor being Mr. T. P. Jones, Arvon Yard. The total cost amounts to over 7,500*l.* The nave, chancel, transepts, north chancel aisle, organ chamber, and vestries have been entirely rebuilt from the very foundations, and the old tower has been restored. The walls inside are faced with Bridgend "Quarrella" stone, the rest of the walling being made up of stones from the old building. Rubble walling was adopted outside with a view of harmonising the rebuilt portion with the tower. The galleries have been removed, the windows remodelled, and the pitch of the roof altered.

BAPTIST CHURCH AND SCHOOLS, PLYMOUTH.—A new church and schools have been erected by Plymouth Baptists in Salisbury-road. The church is designed in Perpendicular Gothic, faced with local dressed limestone and Portland stone dressings. The seating is circular in plan. All the windows are filled with leaded lights, with an introduction of rich colouring into that of the main front tracery window. The roof is partially open, whilst the ceilings are treated in coloured design of the Duresco description. There is seating accommodation for 700 persons. The floor is laid on the slant from the entrance doors. Behind the chapel proper is a ladies' vestry, and from this there will be an exit into the side thoroughfare. The deacons' and the pastor's vestries are also contiguous, both being furnished in oak. The principal floor behind the church will be devoted to the senior female members of the congregation and scholars, and include a ladies' working-room, a young women's Bible-class, and also rooms for the girl Sunday-school scholars. On the ground floor are rooms for infants' and boys' classrooms, and also a large room for social and religious gatherings. Next to the church itself the feature of the whole block of buildings is the schoolroom. It is estimated that it will seat about 800 persons. Throughout the buildings are illuminated with electric light. A kitchen has been provided and fitted with a hot-water apparatus and boilers. Gas supplies the heat for the boilers. It is expected that the new buildings will cost (including site) 9,758*l.* 12s. The work has been carried out from plans prepared by Mr. F. A. Wiblin, architect.

THE ROYAL GRAMMAR SCHOOL, NEWCASTLE-ON-TYNE.—The new Royal Grammar School at Newcastle has just been opened. The buildings consist of three sections, connected by covered ways, carried on stone pillars. In the central block, besides the administrative rooms for the headmaster, assistant masters, and secretary, there is an assembly-hall, capable of seating between 700 and 800 people. Round this runs a gallery, from which open a number of class-rooms; and there is also an art-room, a general school library, and sixth-form-room and special library. The north side is set apart for teaching science. It contains a workshop, chemical lecture-room, and elementary and advanced laboratories, chemical preparation-room, special science classroom, physical lecture-room, physical laboratory for elementary work, a second laboratory for electrical and optical work, physical preparation-room, and dark-room. In the third or south section is the gymnasium, a room measuring 56 ft. by 25 ft., with a gallery to accommodate about 100 spectators. Shower baths have been fitted and bicycle store-rooms are provided. In this section also there is a dining-hall. All the rooms are installed with electricity. The building is of red brick with stone facings. It has been built by Messrs. Arnold, of Doncaster, from designs by Mr. Cooper of Messrs. Russell and Cooper. A sum of 40,000*l.* has been expended in the building and equipment of the new school.

NEW SCHOOLS, HEACHAM.—New schools have been opened at Heacham. The buildings are of car-stone and red bricks, and roofed with flat French tiles. The accommodation provided is for a total of 332 children. It consists of a mixed schoolroom for 100 children, divided into two portions by means of a collapsible folding screen, the upper portion of which is glazed; two mixed classrooms for sixty and forty children respectively; a room for eighty-four infants, divided into two portions, and a babies' room for forty-eight infants. Boys, girls, and infants have separate entrances leading into cloak-rooms, and ranges of wash-basins at the ends. Two small rooms are also provided for teachers' cloaks, etc. The various rooms are so arranged around the connecting corridor and cloak-rooms that either boys, girls, or infants can enter or leave each room through their own separate cloak-room entrance, without disturbing the classes in any other room. Fresh-air inlet vetilation is provided by the lower portion of each window opening backwards, and the vitiated air is carried off by openings in the ceilings connected to "natural" air-pump ventilators. The rooms are warmed by means of open fireplaces. The floors are of pitch-pine blocks. On the south side of the school a house has been built for the master. The architect of the new buildings, master's house, etc., is Mr. H. J. Green, of Norwich and Lynn, and the contractor Mr. Reuben Shanks, of Chatteris and Hunstanton.

JEWS' FREE SCHOOL, SPITALFIELDS.—This school has been almost completely rebuilt from the designs of Mr. E. R. Robson. It is said to be the largest public elementary school in the world, accommodating 1,300 girls and 2,200 boys (total, 3,500). It occupies a site of about 26,500 sq. ft. of ground, and contains seventy-six class-rooms, four spacious halls (having as one function the connexion of the several wings), large numbers of cloak-rooms, store-rooms, ink-rooms for washing and filling all ink-wells, etc. The whole structure is lifted in the air on piers, so that the ground playground underneath is well-nigh co-extensive with the site. It has also two large roof playgrounds. There are shops for instruction in working in wood and metal, a needlework-room, cookery-room, band-room, library, and also four drill-rooms for physical exercises during bad weather. The building is lighted by electricity in every part, and there are two electric lifts for the use of the teachers. Telephones from the rooms of the head-master and head-mistress communicate with every room in the building. Among the special requirements of a school of this size it may be mentioned that there are four caretakers, three servants in the teachers' refreshment department, and about thirty cleaners. The well-being of the large staff of teachers of both sexes has not been neglected, and the entire basement of the Rothschild wing has been, in spite of many difficulties—not the least being that of light—converted into dining-rooms, kitchens, etc., for the two staffs. The various wings of the building are now all heated from one large and central boiler by low-pressure steam communicating with radiators in the various rooms and corridors, while ventilation is effected by ample fresh-air inlets and foul-air outlets. The staircases, of non-slip stone, have a very easy gradient, designed on the principle of relation between tread and riser well known to French architects. The means of access and egress are so efficient that the whole school can be emptied in three minutes. Collapsible grill gates are placed at the foot of each staircase. Special arrangements are made for the distribution of breakfasts to the children at stated hours. The external architecture, in red brick and terra-cotta, represents an endeavour to express externally that the building is not either a London County Council School nor a Church of England School; it has treatments and peculiarities of its own, architecturally distinguishing the unique "Jews' Free School." The cost, exclusive of fittings, has been about 70,000*l.* The builder was Mr. Carmichael; the clerk of the works, Mr. H. Murrell.

DUNDEE BUILDING TRADE.—The past twelve months, though they show an improvement in the volume of business, must be classed amongst the lean years of Dundee building trade. In villa property, and in a less degree in tenements, a considerable amount of activity has been shown. The centrifugal movement so marked at the beginning of tramway development still continues. It takes practical form in the erection in the outskirts of dwellings of the cottage and villa type, but enterprise, speculative and otherwise, is less marked than in former years. It would seem that the wish of the building trade for better times is about to be realised. During the past year work of an estimated cost of 168,000*l.* was carried through in the city, being an increase of 10,000*l.* on the preceding twelve months. The prospects before the trade are of the brightest. While it is true that the requirements of the municipality in regard to the provision of sanitary accommodation have been generally met, works of great magnitude will be commenced during the ensuing year. These are mostly of a public character. So far as the municipality is concerned, there is the scheme of library extension to be carried out in terms of the Carnegie gift—two district libraries, one in the west, at Blackness-avenue, and the other in the north end, at Strathmartine-road, and, it may be, a central reading-room. Then there is the new Technical Institute, funds for which have been secured. On the site of Chapelshade Jute Works, Bell-street, it will be erected. Then in connexion with University College arrangements are being made for the erection of the new Physical Laboratory. The area cleared by the great Seagate fire is a field for the tradesmen. As soon as circumstances permit a start will be made with the building of the new "Bonds." So far as the operations of the past year are concerned, villa building, as stated, has been fairly brisk. The erection of tenement building, it seems, has got a check. Investors, realising that the supply of house property of this description, if it does not actually exceed, as some assert, is fully adequate to meet demand, have exercised restraint.—*Dundee Advertiser.*

RECONSTRUCTION OF THE GLASGOW ROYAL INFIRMARY.—The work of reconstructing the Royal Infirmary has made considerable progress during the past year. The plans, which are by Mr. James Miller, provide, speaking roughly, for three blocks—the northern block, with a projection nouthwards; a central block; and a southern block, with a projection northwards. To meet the necessity for carrying on the infirmary with unimpaired efficiency while the new buildings are in process of erection, it was decided to proceed first with the northern block. The contract for the necessary digger work and for laying the foundations was placed in the hands of Messrs. John Paterson & Son and that for the mason work of the superstructure was entrusted to Messrs. John Porter & Sons. To make way for the new gateway block which will be erected a little to the north of the present entrance to the wards the old gateway block has been demolished, and the work of excavation and laying the foundations for the northern portion will be begun shortly. In this block will be a waiting hall for patients and their friends, examination rooms, and two small operating theatres. The other

half of the block, which cannot be undertaken in the meantime, will contain the casualty wards. The entire scheme when finished will give accommodation for 660, as compared with 584 in the present institution. In the northern block there will be wards for 250 patients. The directors have in contemplation an immediate extension of the nurses' home to be erected to the eastward of the present building; and a new power house and laundry is to be built on the site of the old bowling-green in Wishart-street.

BUILDING IN HULL.—There has not been any outstanding feature of the building trade during the year just closed. Trade has certainly not been good, but there have been times when it has been much worse, so that the builder has to take courage and go forward, hoping that the New Year has better things in store for him. Less cutting down of prices would be welcome, for competition has been unusually keen, and those who have secured contracts will, it is feared, have allowed themselves a very narrow margin. The contractors tell the old story of getting out many prices and receiving few contracts. The speculative builders have had a fairly good year, and it is satisfactory that the failures have not reached beyond the "normal" stage. As a matter of fact, very few builders have gone under, although many complain of hard times. To the casual observer there has seemed to be a good deal of building going on in various parts of the city, although the Corporation have held their hand in the making of new streets. The only buildings they have had on hand are the extensions at Willerby, the contract price of which is about 15,000*l*., the Villa-place public school, the Selby-street public school, and three shops in Jameson-street. The Selby-street school and the shops have just been commenced, so that they will be on hand for some time. The Villa-place school is practically completed, and, like that at Selby-street, will have accommodation for 1,200 children. At one time serious trouble threatened with respect to the extensions at Willerby Asylum, the question arising as to whether the contractor should pay the Hull or district rate of wages. Happily, a settlement was arrived at, and a more definite understanding will be come to before similar contracts are signed in the future.—*Eastern Morning News.*

CHILDREN'S INFIRMARY, LIVERPOOL.—On the 10th inst. her Royal Highness the Duchess of Albany opened the new building in Myrtle-street, which has been provided as a children's hospital at a total cost of 68,000*l*. In the year 1900 the old infirmary in Myrtle-street was reported to be in a very unsatisfactory condition from a sanitary point of view. The estimated cost of re-modelling the old institution far exceeded any sum that the committee thought they would be justified in spending for such a purpose, and under these circumstances it was eventually decided to pull down the building and erect a new one. In response to their appeals for subscriptions requisite to proceed with the new building the committee received sufficient to enable them to give out contracts for the administration and observation blocks, the east pavilion, with accommodation for sixty beds, and the laundry. These parts were opened on the 10th inst. The new out-patients' department is built upon land purchased in Mulberry-street, which is on the east side of the new infirmary, and was opened by the Countess of Derby in 1902. The new "extern" stands alone, environed by streets on three sides and a public passage on the fourth. The grand infirmary, nurses' home, and laundry, which constitutes the main block, will in all give accommodation for 100 cots in five wards, three of which are for medical and two for surgical cases. The ward pavilions are arranged to recesss and radiate to a centre, to which is joined the administrative department. The triangle formed by this recessing and radiating of the ward pavilions fronts to Myrtle-street, which is a full south view. Messrs. Haigh & Thompson are the architects.

BEDFORD BUILDERS' ASSOCIATION.—The fifth annual dinner of the Bedford Builders' Association was held at the Central Restaurant on the 5th inst. Mr. Richard Black, President of the Builders' Association, occupied the chair, and was supported by Mr. Charles Negus, Vice-President, Mr. G. Haynes (Mayor of Bedford), and others. Mr. Negus proposed the "Mayor and Corporation," to which Mr. Haynes replied. Mr. J. P. White, with whose name the toast was also coupled, paid a tribute to the excellent qualities of Mr. Greenshields, the Borough Surveyor. Mr. Halliley then gave the toast of "The Builders' Association," and said Bedford had not suffered nearly so much as some towns and the number of empty houses had decreased wonderfully. The interests of the town were very much in the hands of the builders, and it was to their interest that they should keep their eyes on the Corporation and see that matters were well managed. Healthy and fair-minded criticism was an exceedingly good thing, and those who were criticised would be all the better for it. The chairman, in responding, said they did not ask for any favour or seek to evade or break any by-law necessary for good building, but wanted to work harmoniously with the town council. It was to the interest of the builders that everything they did should be well and substantially done. Nothing could be more injurious than a jerry-building system. They wished to help the Corporation to carry out the sanitary arrangements so that they would be beyond suspicion and doubt, and if the Borough Engineer could make any suggestions to the advantage of the town, the Builders' Association was willing to carry them out. He agreed that there were indications all over the country that things were going to be better, and that was to the interest of everybody, because nobody employed more labour or spent money more freely than the builders. The remaining toasts on the list were "The Town and Trade of Bedford," proposed by Mr. G. Lee Roberts, and responded to by Mr. Lindley; "The Visitors," proposed by Mr. F. Corby, and responded to by Mr. W. A. Attenborough and Mr. Edmund Walker; "The President," proposed by Mr. C. Carter, and responded to by the chairman.

Sanitary and Engineering News.

COVENTRY WATER SUPPLY.—At a statutory meeting of the electors of the city, held on January 10, under the presidency of the Mayor, a resolution was carried by seventy-six to two votes in approval of a measure to be introduced in the course of next Session of Parliament to enable the City Council to obtain a supply of water from the Birmingham Corporation. Under a provisional agreement Coventry will get a daily supply of at least one million gallons from Shustoke reservoir, at a minimum payment of 5,000*l*. per annum. The works for conveyance of the water will cost about 81,000*l*., for a line of pipes having a least diameter of 20 in. along the distance of 14 miles between the Birmingham delivery main at Whitacre and the existing reservoirs, and for additional reservoirs to be constructed at Coventry. The scheme supersedes the recent project to obtain water at Weston-under-Wetherley, about seven miles distant from Coventry.

NEW LANCASHIRE WATERWORKS.—In connexion with three Bills introduced into Parliament this year by the Heywood and Middleton Water Board, the Ashton-under-Lyne, Stalybridge, and Dukinfield District Water Board, and the Southport, Birkdale, and West Lancashire Water Board, estimates of expenditure, etc., have now been deposited by the promoters. In the Heywood case Messrs. James Diggle & Sons, Engineers to the Board, estimate the cost of permanent works proposed to be executed by the Board at 125,000*l*., 85,000*l*. being for excesses of estimates for works carried out in excess of and authorised in 1877 and 1901 in the way of purchase of lands, construction of reservoirs, catch water, etc., and 40,000*l*. for lining out crops and construction of filters. For the construction of the Ashton waterworks Mr. George H. Hill, of Manchester, estimates that an expenditure of 220,000*l*. will be required, being 137,454*l*. on works for purposes already authorised and 55,226*l*. for other purposes, less 110,049*l*. capital already authorised but not called up. The amount proposed to be spent by the Southport Board is 2,736*l*., as estimated by the engineers, Messrs. Henry Rope & Son.—*Manchester Evening News.*

COAST EROSION, ROKER, SUNDERLAND.—A special meeting of the Sunderland Town Council is to be held shortly to consider alternative schemes for preventing the erosion of the cliffs at Roker. The schemes have been prepared by Mr. Moncur, Borough Engineer, and Mr. H. H. Wake, Engineer to the River Wear Commissioners. By the first, and principal, scheme, which is estimated to cost 31,000*l*., it is proposed to extend the lower promenade at Roker round the Holey Rock (Abb's Point) to Sea-lane, with a footpath and roadway, and a tunnel through Holey Rock giving access to the promenade extension during heavy seas. This scheme also provides for a substantial sea wall. The alternative scheme is for a sea wall only. There would be no promenade, and the wall would follow the irregular line of the cliffs, thus protecting them from erosion. It would have a height of 15 ft. above high-water mark at extreme spring tides. The cost of the wall is set down at 11,000*l*. —*Yorkshise Post.*

Foreign.

FRANCE.—The "Vieux Paris" Committee have demanded the classification, as "Monuments Historiques," of the pavilions of the Parc Monceau and of La Villette, also of the columns and the two pavilions of the Place de la Nation and the two pavilions of the Place Denfert-Rochereau. These various pavilions, in rotunda form and decorated with pilasters, form the last vestiges of the old boundary wall of the "Fermiers Généraux." They were built in the XVIIIth century from the designs of Ledoux.——There is to be opened at the Bibliothèque Nationale in the course of this spring an important exhibition of portraits, drawings, miniatures and manuscripts of the XVIth century.——M. Brou, the sculptor, has completed the model for a monument to be erected at Paris to the memory of Villiers de l'Isle Adam.——It is proposed to create provincial art museums in the bishops' residences which have become vacant owing to the separation between Church and State.——A new Kursaal has been opened at Orléans, near the Pont Corneille. It is from the design of M. Victorin Lélong, and has been decorated by several eminent painters.——About 5 million francs are to be spent on new buildings at Grenoble, including a Secondary School for girls, a Faculté des Sciences, an Industrial Art School, a military hospital, and an improvement of the principal square.——The Municipality of Port de Boue (Bouches du Rhône) have voted a sum of 315,000 francs for the construction of a quay for the maritime service of the town.——The death is announced, at Brighton, at the age of 77, of the painter Touchemolin, an Alsacian by birth, who had devoted himself especially to the illustration of French military expeditions.——M. Fournereau, the architect, and author of some well-known works on Oriental architecture, has died, at the age of 61. He had made various explorations in Cambodia, and at the Congress of the Société Centrale des Architectes in 1889 he obtained a medal for his work in archæology. The jury of the great exhibition of 1900 awarded him a gold medal for the remarkable drawings he contributed, especially the restoration of the pagoda of Angkor.

GERMANY.—It has been decided to restore the great hall of the ancient Rathaus of Regensburg. The original decorations and paintings are to be refixed in their places; the priceless tapestries of the XIVth, XVth, and XVIth centuries are to be rehung; the old furniture is to be replaced, and walled-up windows are to be opened. In short, the hall is to reassume the appearance it presented from 1663-1806, when Parliament met there.——The town of Amberg, in the Upper Palatinate, which lately has attracted much attention in art circles on account of its picturesque mediæval gates and walls, also contains fine examples of XVIIIth century joinery in its oak street doors. These are usually double, with all the rich mouldings and ornament carved in the solid so as not to be affected by the weather, and put together with wooden pins. The elaborate knockers and furniture are of bronze, while the fanlights above are protected by ornamental wrought-iron gratings. Some of these doors are fantastically Rococco, but the excellence of the workmanship condones the design.——The Ethnological Museum in Cologne, presented to the city by the families Rautenstrauch and Joest, was opened last November. The first ethnological society was founded in Paris in 1839, and ten years later the first museum for the furtherance of this science was built in Copenhagen. Since then London, Rome, and Vienna, amongst other towns, have built similar museums. Herr Edwin Crones, of Cologne, designed the building in question, which was erected for the sum of 500,000 marks.——Not many municipalities are in the same happy position as Charlottenburg, of voting for their town hall a sum that allows the architect free play with his imagination. Messrs. Reinhardt & Süssenguth have valiantly carried out their instructions, "splendour at any price"—instructions which made the task harder than if reasonable limits had been set to the expenditure. Charlottenburg Town Hall, opened nearly two years ago, is an imposing example of ornate architecture whose design is so powerful that it is able to carry off successfully its overload of decoration. The internal decorations and fittings have been carried out on the same lavish scale as the external ornament, for gold, like noblesse, has its obligations.——The west front of the noble cathedral of Freiberg, Saxony, celebrated amongst other reasons for its golden doors, is about to be restored. German architects have been invited to send in competitive designs for the work, the sum of 4,500 marks being offered in prizes.

SWITZERLAND.—Messrs. Escher, Wyss, & Co., of Zurich, have patented a new fuel for use on board submarines which will overcome the disabilities of those fuels at present in use. Steam cannot be used as a motive power below water on account of the bubbles it would generate, which would betray the presence of the boat, and electricity, being stored in accumulators, limits the distance the boat may travel. The new discovery is a gas which dissolves in water and leaves no bubbles.

ITALY.—The cardinals' monument to the late Pope Leo XIII. in the church of St. John Lateran at Rome is nearly completed, under the superintendence of the sculptor, Signor Tadolini, who carved the colossal statue of the late pontiff which, on January 9, was placed in position above the door of the sacristy on the left side of the choir. In the course of next month the remains of Pope Leo XIII. will be removed into an urn-shaped receptacle between

the two flanking statues which represent the Church and Labour. The cost, about 2,400*l.*, of the memorial is defrayed by the survivors of the cardinals created by the late Pope.

INDIA.—The Treasury Office and Sessions Court at Hyderabad, recently destroyed by fire, are to be replaced by modern buildings.——A wireless telegraph-station and buildings are to be erected at Slipper Island at a cost of Rs15,900.——The cost of restoring Akbars Tomb at Sekandra, by the archæological department, amounted to Rs62,175.——Improvements to the eleven lighthouses of the Burma coast are to be made at a cost of Rs4,00,000. The incandescent oil gas system is to be installed.——Plans are being prepared for the new Bengal Agricultural College at Sabour, near Bhagalpur. ——Proposals for the improvement of the existing Presidency College at Calcutta, or the building of a new college in a suburb of Calcutta, are under consideration. The cost of either scheme would approximate Rs20,00,000.——Chittagong is a coming port, and within the next two years extensive building operations are anticipated, as factories, mills, wharves, etc.——An Archæological Museum is to be established at Peshawur, similar to the museum at Lahore.——A gift of 1,000*l.* has been made to the Cuddalore Municipality, to erect a market building at Tiruppappuliyur.——Cement is largely used in India; and Japan is making rapid strides in the export of cement manufactured in that country. One company at Osaka is working day and night to overtake orders, and the company is increasing its yearly output to 250,000 tons.——The new Bombay Agricultural College, at Ganeshkhind, is being erected at a cost of Rs5,25,000.——The appointment has been made to the Indian Archæological Department of Dr. Sten Konow, to be Government Epigraphist for India.——Brick-making in India is in a highly prosperous condition, the prices to-day for good pug-mill bricks being about 50 per cent. higher than a year ago. Inexpensive modern appliances and machinery are, however, required. A German firm are erecting a large tile factory at Feroke, worked by a 70-h.p. engine, and with a kiln having a capacity for 200,000 tiles at a time. Why do British firms leave these industries to foreign enterprise?——Twelve paddle-boats, each 250 ft. in length, are being built in Scotland for a Calcutta firm. They will be sent to India in pieces.——The Madras Government have made a special grant of Rs14,00,000 for this year for the construction of bridges, roads, etc. ——A Director of Technical and Industrial Inquiries has been appointed by the Madras Government for a term of five years.——An Indo-Japanese Association at Tokio furnishes information respecting Japanese manufacturers, and gives addresses and introductions to Japanese firms willing to trade with India. Japanese manufacturers are being represented in India, and a great effort is being made to acquire a complete mastery of the requirements of Indian buyers. India imports from Japan glass, porcelain, cement, metal goods, gas and oil engines, paints, chemicals, pencils, scientific apparatus, engineering and building materials, etc.——The city market at Bangalore is to be extended.——It is suggested to turn the bed of the water-tank at Bangalore into a park or a polo-ground. ——The Birchwood Estate at Darjeeling is situated in the most central part of the "Queen of the Hill Stations," and houses are fitted with electric light. Rents run from Rs500 to Rs3,000 per season. Building is proceeding. ——The Kapu Union at Bangalore propose to build a Home for Vokkaligar students, with library, agricultural, and industrial museum, experimental farm, etc.——The Hill Stations of Ootacumund, Coonoor, and Kodaikanal are to have a new Municipality Bill. The tax on house property is to be increased from 16½ per cent. on its assessed value to 20 per cent., which is the largest house tax in India. The increased revenue will be spent on roads, lighting, sanitation, new modern houses, improved milk buildings, etc.——Under the Calcutta Smoke Nuisances Bill, six months are allowed to make structural alterations in chimneys, etc.——A new Town Hall is to be built in Chamrajpet Extension, Sagar.——A School of Electricity has been started by the Government of Mysore. Some of the pupils are over fifty years of age.——A "Women's Home" is to be built at Bangalore. ——Canal colonisation work in the Punjab is progressing, and in the Chenab Canal Colony some 1,900,000 acres have been covered with new settlements, with a population of 858,000 persons, drawn mostly from the overcrowded districts of the Central Punjab. These new estates have been made out of waste lands by canal irrigation, and the profit earned last year on capital outlay was 24½ per cent., and the crops raised valued 3,000,000*l.* The development is proceeding.——The Madras Government have sanctioned a hospital at Ramachandrapuram at a cost of Rs14,460.——New police schools have been constructed at Trichinopoly, Vizianagram, and Vellore.——An Indian Institute of Science is to be founded, and buildings will be erected at Bangalore. The Universities of Liverpool, Manchester, Leeds, Birmingham, and Sheffield will be taken as a guide.——Landslips are one of the fates of the builder and property owner in India.——The extension of St. George's Cathedral cemetery at Madras is proceeding.——The Act for the protection of ancient monuments in India does not apply to buildings used for religious observances.——At Allahabad the new Christian Princeton Student Building has been opened. This was erected by funds collected from friends of the Princeton University, United States of America.——The Punjab Government Tenants Act Amendment Bill, introduced in the Punjab Legislative Council, prescribes the procedure to be followed in starting a new colony, building, sanitation, tree-planting, etc.——The National Bank of India is spending Rs1,00,000 in converting the poor-house of Amritsar into a bank. ——The budget estimates of the Bombay Municipality for 1907-8 estimate the expenditure at Rs96,39,886, and income Rs92,14,000. The deficit will be met in the usual way. Particulars of taxation and present income derived show—General tax, including fire tax, Rs32,20,000; bicycle tax, Rs10,000; water tax, by valuation, Rs9,27,000; water tax, by meter measurement, Rs7,99,200; beer, Rs15,900; firewood, Rs35,000, etc.——The dedication of the new vestry and reredos of St. Paul's Church at Poona has taken place. The new reredos is a beautiful piece of work, the foundation being of alabaster picked out in grand relief with gold and coloured mosaic, the design being that of the Ascension.——The building contract for the Victoria Memorial Hall at Calcutta will shortly be given out.——The Calcutta improvement scheme will shortly be proceeded with.——The Port Commissioners of Calcutta have acquired fresh ground for their great scheme of dock extension.——Rats still infest the country. During November 95,000 were killed in Rangoon, the reward offered being 2 annas (2d.) per rat, the total reward for the month being Rs11,500.—— *Note.*—The rupee can be taken at 1s. 4d. Thus, Rs15 equal 1*l.*

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT. —Mr. Charles M. Manuelle, granite merchant and steamship owner, 120-123, Fenchurch-street, having been compelled, owing to ill health, to relinquish his business, has made arrangements for the transfer of it to Messrs. Blichfeldt & Co., of 16, Water-lane, E.C., who will now contract for supplies to be delivered from April 1 next. They will therefore be the sole concessionnaires in the south of England for the Quenast granite from the Quenast quarry.

ST. PERAN, CORNWALL.—Mr. Edmund Sedding has drawn up a report upon the condition of the oratory of St. Peran, near Perran Porth, which he considers to be of VIIth century date. The ancient church of Perran-in-the-Sand, or Perranzabuloe, was a collegiate foundation, for a dean and canons, *temp.* Edward the Confessor; having been overwhelmed by the sand, it was succeeded by another church which in turn suffered the same fate. The fabric of the oratory, which measures 25 ft. by 12½ ft., is constructed of unhewn stones, without mortar; the gabled west wall remains almost intact. Mr. Sedding estimates that the work of preservation will cost about 500*l.*, and most of that sum should be expended in draining the site. The oratory was found, about seventy years ago, beneath the sands, and then contained an altar of stone, with stone benches along the sides.

BORDEAUX EXHIBITION.—A site near the quay has been allotted for purposes of the buildings for the Bordeaux Exhibition to be held in April—October next. The exhibition will be chiefly maritime in character, and will celebrate the centenary of steamship navigation which has developed from the first voyage, in 1807, of the *Claremont* on the River Hudson. M. Bertin, Director of Naval Construction to the French Admiralty, is Chief Commissioner of the exhibition.

CLAYTON HILL, SUSSEX.—Mr. Clayton Botham, architect and surveyor, who is Chairman of Keymer Parish Council, has formulated a scheme for a local improvement which, at an estimated cost of 13,000*l.*, will greatly relieve the traffic by the main road between London and Brighton. Mr. Botham proposes to substitute for the steep incline of the existing highway as it ascends the South Downs a new road having a less gradient a short distance west from the main road, and nearer to Poynings. A committee of members of the local authorities is formed to obtain promises of co-operation and contributions, and to lay the project in its perfected shape before the County Council. The making of the new road would, it is stated, provide work for the numerous unemployed in that part of the county.

OPEN SPACES (LONDON AND THE PROVINCES).—At the last public meeting of the Metropolitan Public Gardens Association, held under the presidency of the Hon. Dudley F. Fortescue, the draft annual report and statement of accounts were adopted. The income in the year 1906 amounted to 2,300*l.*, a decrease from that in the previous twelve months, and the expenditure amounted to more than 2,200*l.* By reason of the deaths of many generous supporters during the year the Chairman strongly urged that efforts should be made to increase the membership of the association. It was resolved to devote a balance of 34*l.* upon the purchase of the Hermit-road recreation-ground at West Ham to the erection of a drinking-fountain in the ground. A sum of 350*l.* is required to complete the purchase before January 23 of the beautiful tract of natural woodland, about 13½ acres, known as Purley Beeches, in Sanderstead parish near Croydon, where building operations are rapidly extending over the Downs. Purley Beeches belonged to William Tooke, who, aided by John Horne, successfully resisted in the House of Commons an application made by Thomas de Grey, lord of the manor, for powers to enclose wide areas of common lands in that locality. Horne went to live with Tooke at Purley House, and, becoming his heir, assumed his name. Horne Tooke wrote his "Diversions of Purley" at Purley House, which had been the country seat, *temp.* Charles I., of President Bradshaw.—In order to provide the crews of the Fleet at Portland with a suitable park and recreation-ground the Admiralty have given their sanction to the acquisition of an extensive site in the suburban district of Wyke, to replace the existing and quite inadequate ground at Castletown.—The Local Government Board have approved of a loan of 32,000*l.* to be raised by the Ilford Urban Council for acquiring a further portion of the Valentines Estate, whereof Mr. Holcombe Ingleby presented 10 acres of ornamental garden and finely-timbered ground, the "American Gardens," valued at 10,000*l.*, to Ilford twelve months ago. The owner concedes an option to purchase the remaining land in the course of two or three years. The whole area extends over 100 acres, and its addition to the present central public park will provide an aggregate open space of 140 acres. Some private recreation grounds lie between the public park and the American Gardens, but Mr. Ingleby has undertaken to give facilities for linking up the two sections of Valentines Park. The vine at Hampton Court Palace was planted in 1768 from a slip of a vine which Sir Charles Raymond had planted at Valentines in 1758.

THE PROPOSED NEW CONCERT HALL.—We are informed that it is intended to call the new concert hall, proposed to be erected in Great Portland-street, "St. James's Hall," in memory of the old concert hall of that name. The choice is suitable enough, but we earnestly hope that the new St. James's Hall will be a much better planned building than the old one.

"VENTURENE" WALL TILES.—Messrs. Chance Bros. & Co. (Birmingham) send us specimens of their "Venturene" wall tiles, which are thin tiles for walling, and the makers recommend that they should be set with the special cement sold by them for the purpose. They claim that their patented process used in the production of these tiles ensures the production of tiles of uniform size and with clean-cut edges. The specimens sent to us are white and light green, and with a plain face or a geometrical design. Those with a plain face have a slight waviness or irregularity on the surface, which would have the effect of breaking up the reflection of light and giving more texture to the wall surface than a perfectly smooth tile would impart. They seem exceeding good wall tiles, but we notice that there is no key for the cement on the back surface.

LINDSAY NEAL'S BLOTTING-PAD AND CALENDAR. —This is a particularly neat and convenient form of blotting-pad, measuring 12 in. by 8 in., and provided with stiff cloth covers opening right and left. On the inside of the right-hand cover is printed a calendar for 1907, and on the inside of the other a table of distributed loads for rolled steel joists in sizes ranging from 20 in. by 7¼ in. down to 3¼ in. to 1⅝ in., and for spans of from 6 ft. to 30 ft. This table has the useful addition of a thick black line showing the limits of span beyond which excessive deflection is caused by the stated loads. The covers serve to keep the blotting-paper clean and are quite plain on the outside, so that when the pad is closed there is no suggestion of an advertisement. This is a feature which should contribute to the acceptability of the pad to professional men.

THE DISCOVERIES NEAR FOLKESTONE.—The excavation for the road has now been completed, except for the removal of the plateau on which the skeletons lie, and this is to be effected during the course of the week. Besides twenty-five skeletons, the discoveries now include some most interesting relics, amongst them the centre-piece of a shield with silver rivets, a broadsword some 3 ft. in length, two daggers, and some pike-heads, and various articles of ornament—buckles, a brooch set with stones, and some necklaces of amber and inlaid stones. The two coins have been identified as belonging to a period between 300 and 500 A.D. Unless the Lord of the Manor himself carries the investigations further, or allows private enterprise to pursue them, it appears that no further excavations will be now made. The relics now discovered lay only some 18 in. below the surface.

ASYLUM BUILDINGS AND ARCHITECTS.—Evidence was given, on the 14th inst., by Mr. J. S. Davy, C.B., Chief General Inspector and Assistant-Secretary of the Local Government Board, at the sitting of the Royal Commission on the Care of the Feeble-minded. At the outset, Mr. Davy put in the following table, showing the increase in the number of lunatics since 1859:—

	1859.	1906.
Lunatics chargeable to the guardians	30,130	109,350
Lunatics chargeable to counties or boroughs	1,652	1,729
Non-pauper lunatics	5,361	10,723

Mr. Davy mentioned that it was intended to hold an inquiry in regard to the expenditure by the Hammersmith Board of Guardians of a sum of over a million on new buildings. Dealing with building expenditure generally, he said the system of paying architects a 5 per cent. commission on expenditure was radically wrong. It was a strong inducement to them to use the best of everything. In Sussex it had been proposed to build accommodation for cattle and pigs at a price working out at 50*l.* a pig. It was also suggested that there should be a separate mortuary for males and females. He thought it was the architect who suggested separating the sexes after death.

MEMORIAL TO THE LATE MR. INDERWICK.—On the 14th inst. the Lord Chief Justice unveiled a bust of the late Mr. Inderwick, K.C., in the Bar Library at the Royal Courts of Justice. The bust was executed by Mr. George Frampton, R.A., and bears an inscription on the plinth.

AN ARTISTIC CALENDAR.—We do not make a rule of noticing trade calendars, which come in showers at this time of year, but we may make an exception in the case of that sent us by the Bromsgrove Guild, which is really a work of art. It consists of an upright card of a rich dark brown tint, to the lower part of which is attached a square calendar in flaps for each month; on the upper portion of the card is affixed a small bronze relief, very well executed, showing a figure of a nude boy holding up a globe in front of a figure of Time as an aged man, whose drapery forms the background to the boy and the globe. Under it is the motto "Progress with Time." It is a very nice bit of artistic work.

OLD ARCHITECTURAL ASSISTANTS' DAY STUDENTS' CLUB.—The sixth annual dinner of this club will take place on Wednesday, January 30, at the Florence Restaurant, Rupert-street. Members may obtain tickets, price 4s. 6d., from the Hon. Sec.; those applied for on and after January 28, price 5s.

Legal.

MAIDENHEAD BUILDING DISPUTE: ARCHITECT'S APPEAL.

THE case of Lanning *v.* Davy & Salter came before the Court of Appeal, consisting of the Master of the Rolls and Lords Justices Cozens-Hardy and Moulton, on the 16th inst., on the defendants' application for judgment or new trial on appeal from verdict and judgment at trial before Mr. Justice Darling and a common jury in the King's Bench Division.

This was an action by Mr. Harold Sydney Lanning, of Maidenhead, to recover from the defendants, a firm of architects and surveyors, of Maidenhead, damages for alleged negligence. The defendants denied the alleged negligence and counterclaimed for 87*l.* 3s., fees for work and labour done.

The dispute arose in connexion with the erection of a house, conservatory, and stables for the plaintiff at Boyn Hill-avenue, Maidenhead. The plaintiff's case was that in the early part of 1903 he instructed Mr. Davy to prepare plans, specifications, etc., for the buildings, and these were prepared. Ultimately tenders were invited and sent in. That of Messrs. J. K. Cooper & Sons was the highest (1,856*l.*), and that of Messrs. Cox & Sons the lowest (1,698*l.*). On January 19, 1903, Mr. Davy informed the plaintiff that Messrs. Cooper were prepared to reduce their tender by 5 per cent., and the plaintiff finally accepted this figure. On March 6, 1903, the contract was signed, which was for the erection of a house, conservatory, and stable, and the work, with the exception of the stable, was finally completed with some variations by September or October, 1903. Mr. Davy gave four interim certificates for 300*l.* each, which the plaintiff paid. In April, 1904, the architect gave a further certificate for 350*l.*, but on May 9 plaintiff's solicitors wrote revoking defendants' authority to certify. Defendants, however, on August 11, 1904, certified for a further 350*l.* as due to the builders, and on October 30 they certified the balance of 80*l.* 19s. 2d. Shortly afterwards Messrs. Cooper issued a writ claiming payment of these two sums, making together 430*l.* 19s. 2d., and the plaintiff in that action, by his defence, alleged that the work was badly done, and counterclaimed in respect of a certain right of way and for the cost of putting the work right. Messrs. Cooper, by their reply, set up the contract, and alleged that the plaintiff could not maintain his defence and counterclaim upon the main grounds that the contract provided that the architect's certificate should be conclusive evidence of completion, and that as the architect had given a final certificate the plaintiff was precluded from relying upon the various matters alleged in his defence and counterclaim. That action came on for trial, when Mr. Lanning's counsel advised him to settle the case. The action was settled on terms which provided in effect for the plaintiff selling his house to Messrs. Cooper for 2,000*l.*, less the amount of the certificates and the taxed costs of the action. In the present action the plaintiff alleged that the defendants had not carried out his instructions with regard to the position and size of the rooms, that they had been negligent in supervising the execution of the work, in taking out the quantities, and in advising him not to accept the lowest tender. The plaintiff further alleged that the defendants negligently and without any authority, express or implied, and in breach of their duty as plaintiff's architects, purported to bind the plaintiff by the terms of the agreement of March 6, 1903, whereby the defendants as between the plaintiff and the builders, Messrs. J. K. Cooper & Sons, constituted themselves final and sole arbitrators and made their certificate final and conclusive.

The defendants by their defence denied that they had failed to carry out the plaintiff's instructions in preparing the plans as alleged, and said that they had exercised all reasonable care and skill in their employment. Defendants further said that they asked Messrs. Cooper to reduce the amount of their tender at the plaintiff's request, and the tender was reduced to the sum of 1,764*l.* They also denied that they had negligently supervised any of the work or had been guilty of any negligence. Defendants further relied upon the agreement of March 6, 1903, made between the plaintiff and Mr. Henry Cooper as barring the plaintiff's claim, and particularly to provisions thereof whereby it was declared that the architect's certificate should be final and binding as between architect and client, and that in all disputed points arising from such agreements the architect's decision should be final and binding by both parties, and that such agreement should be deemed a reference to arbitration. Defendants said it was the fact that they purported to bind the plaintiff by the written agreement of March 6, 1903, but they denied that they did so negligently or without authority, or in breach of their duty as the plaintiff's architects. They said that such agreement was prepared in the plaintiff's interest, and was put forward and procured to be executed by the builders in the ordinary course of the defendants' duty as such architects. By the counterclaim defendants claimed 87*l.* 3s., being 5 per cent. on the contract price, duplicate copies of plans, etc. The trial resulted in a verdict for the plaintiff for 750*l.* on the claim, and for the defendants for 50*l.* on the counterclaim, and judgment was entered accordingly. Hence the present appeal of the defendants.

Mr. George Wallace appeared for the appellants, and Mr. G. A. Scott for the respondent.

Mr. Wallace, in opening the case, said it was an action by the plaintiff against the defendants, a firm of architects, for damages for alleged negligence.

The Master of the Rolls said that Mr. Justice Darling had reported to the Court that in his opinion the verdict was quite wrong.

Mr. Wallace, continuing, said the position was a curious one, because the plaintiff had not sustained a pennypiece of damage by what the defendants had done. The plaintiff did not really base his case on the ground that the house was not a good one, or because it was defective, or because he had suffered any inconvenience by the house, but he said he had been unable to defend an action which the builders brought against him for the balance of the certificates, and he claimed against the appellants to be paid the costs which he had had to pay to the builders in that action and his own costs, some 500*l.*, and he said in the witness-box that he was over 600*l.* out of pocket. At the time of the trial the plaintiff was living in the house, but in December, 1905, the action by the builders for the balance of the certificates came on to be tried. Mr. Lanning's counterclaim in that action related to some right of way, and even the costs of that he wanted to make the architects pay. When the case came on for trial it was found that Mr. Lanning had not got a shadow of a case against the builders and the action was settled on terms. Mr. Lanning had paid about 1,630*l.* on the architects' certificates, about 300*l.* for the land, and other small sums amounting altogether to about 2,000*l.*, and the agreement was that the builders should take over the house for the 2,000*l.*, and that was done. So all Mr. Lanning's case as to the insufficiency of the house was gone. No evidence was given that the plaintiff had suffered any money damage.

The Master of the Rolls: What is the plaintiff's real cause of action?

Mr. Wallace: That we have been guilty of want of care, or want of skill, or breach of duty, which caused him damage.

The Master of the Rolls: He must have alleged some duty towards him in some particular respect in regard to which the architects had failed.

Lord Justice Cozens-Hardy said he gathered from the pleadings that the plaintiff's case was that the architects by their negligence gave him a house worth much less than he bargained for.

Mr. Wallace: The fact that Coopers paid the full value of the house disposes of that. They paid the full contract price for it.

Mr. Scott said he based his case first of all on the ground that defendants gave improper advice to the plaintiff as to his accepting the highest tender instead of the lowest, and, secondly, that the bills of quantities represented a great deal more than what was necessary for the builders to tender upon.

Mr. Wallace said that the difference in the tender price was about 68*l.* Nobody, of course, had ever heard or could expect that all the quantities in a bill of quantities were accurate. He contended that the plaintiff had made out no case of damage, and in any event that the damages awarded by the jury were excessive.

Mr. Scott said the case he put forward on behalf of the plaintiff was that he employed the defendants as his architects to draw the plans, etc., of the house and to put the plans and specifications before builders. Plaintiff's case was that the bills of quantities were carelessly drawn. The defendants themselves got out the bills of quantities and they were paid by the builders in the ordinary way by a percentage on the amount of the tender. Therefore the defendants as architects were under a contract for reward to use reasonable care in preparing the bills of quantities.

Lord Justice Moulton: What is the amount for that?

Mr. Scott said that the bills of quantities showed a large percentage of work required which was really not required. He thought there was evidence for the consideration of the jury that the bills of quantities were drawn in excess of what was required.

The Master of the Rolls said that the amount on that head only came to about 15*l.*

Mr. Scott observed that the next point was as to the tender.

Lord Justice Moulton said the amount as to that was 68*l.*, and the two items together only came to 83*l.*

Mr. Scott replied that the plaintiff had given evidence that 600*l.* was the out-of-pocket loss he had suffered by reason of the settlement he had been obliged to make with the builders, and he submitted that the jury were entitled to award the plaintiff that amount as the loss he had sustained through the negligence of the defendants. The plaintiff alleged and the jury, who had had a view of the house, considered that he had got a second-class inferior house instead of a first-class house.

Lord Justice Moulton said the plaintiff claimed from the architects the costs of an action which he had had to pay to the successful party, although plaintiff never consulted the architects before agreeing to the compromise.

Mr. Scott contended that there was abundant evidence to justify the verdict. He had proved that the house had not been built according to specification, and that it would cost a great deal of money to put it right. There was evidence to show that Mr. Lanning had lost by the settlement arrived at 600*l.*, and it was proved at the trial that the house which had been built was of much less value than it ought to have been.

At the conclusion of the arguments of counsel the Master of the Rolls, in giving judgment, after stating the facts, said that Mr. Lanning at the time the action was brought against him by Messrs. Cooper, the builders, ought to have appreciated that he had really no defence to that action at all, and therefore no costs need have been incurred at all. He was not satisfied that a single farthing ought to be recovered by the plaintiff in this case. It was not proved that the plaintiff ought to have defended the action brought against him by the builders, or was justified in defending that action, and if he was not his whole case against the defendants on that head had gone. There was no doubt, in existence, the verdict of the jury that the architect Mr. Davy had been negligent, and that certain defects in the building were due to his negligence. But that was a hundred thousand miles away from the fact that the plaintiff had suffered any damage by that. So far as there was a conclusion in the plaintiff's favour it rested on the verdict of the jury. They had received a report from the learned judge who tried the case that he was thoroughly dissatisfied with the verdict, and he (the Master of the Rolls) was bound to say that he showed that dissatisfaction himself. In his opinion, therefore, it was quite

LEGAL,—*Continued on page 79*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x. Public Appointments, xix.; Auction Sales, xxx.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

Competitions.

* FEBRUARY 20.—**Liverpool.**—CHURCH.—The Rev. G. Peters, 71, Hope-street, Liverpool, is prepared to receive drawings from architects in Lancashire for a new church, to be built of Yorkshire stone on outside and Runcorn Fleck on inside, with a tower at least 65 ft. high and 16 ft. square. To seat about 700 adults. To cost about 7,500*l.* Site measures about 120 ft. by 90 ft. Drawings and plans to be sent at the expense of the sender.

* MARCH 15.—**Bishop Auckland.**—SCHOOL.—Plans are invited for a secondary school at Bishop Auckland. Author of selected to be employed to carry out work at a commission of 5 per cent. Premiums of £20 and £10 will be paid for those placed second and third respectively. Plan of site, conditions of competition, and terms of employment may be obtained from the Secretary for Higher Education, Shire Hall, Durham, to whom plans, carriage paid, must be delivered not later than noon on March 15.

Contracts.

BUILDING.

JANUARY 19.—**Alnwickhill.**—COTTAGE.—Edinburgh and District Water Trustees invite tenders for the mason and brick, carpenter and joiner, plumber, slater, and plaster and cement works in connexion with the double cottage, etc., proposed to be erected at Alnwickhill. Schedules of quantities may be had on application to Mr. Edward C. Carse, architect, 37, Frederick-street, Edinburgh. Tenders, endorsed "Double Cottage, etc., Alnwickhill," must be lodged with Mr. William Boyd, W.S., Clerk to the Trust, Edinburgh and District Water Trust Offices, 12, St. Giles's-street, Edinburgh, not later than January 19, at 10 a.m.

JANUARY 19-24.—**Daviot (Scotland).**—SCHOOL-HOUSE.—For mason, carpenter, slater, plumber, plasterer, and painter and glazier's work of new school-house at Daviot, for the School Board. Plans and specifications may be seen at the Manse. Messrs. Hendry, builders, will meet contractors on January 19, from 1 to 3 p.m., to point out the site and materials. Sealed tenders, marked "Tender for School-house," to be lodged with the Chairman, Rev. Alexander Anderson, the Manse, Daviot, by January 24.

JANUARY 19.—**Downpatrick (Ireland).**—REPAIRING WALL.—For repairing a wall at Newcastle Harbour. Specification may be seen with Mr. James Foland, harbour constable, Newcastle; or at the County Surveyor's Office, Downpatrick. Tenders, endorsed "Newcastle Harbour," to be lodged in the County Surveyor's Office, Downpatrick, before 12 noon on January 19.

JANUARY 19.—**Ossett.**—SCHOOL.—Ossett Education Authority invite tenders for any of the following trades, viz.:—Masons and bricklayers, carpenters and joiners, plumbers, plasterers, painters, and slaters' work in connexion with the erection of Southdale Council School, Ossett. Names to Mr. E. Lucas, Secretary, Education Office, 2, New-street, Ossett, on or before January 19. A deposit of 1*l.* must accompany each application. Cheques to be made payable to Mr. E. Lucas. Mr. W. A. Kendall, architect, Bank-street, Ossett.

JANUARY 19.—**Staplehurst.**—COTTAGES.—The erection of three cottages on the Spilsile Estate, Staplehurst. Plans and specifications may be seen at Oakfield, Staplehurst, between the hours of 10 a.m. and 3 p.m., from January 16 to 19. Mr. W. Brooks, architect.

JANUARY 19.—**West Bridgford.**—OFFICES.—The West Bridgford U.D.C. invite tenders for the erection, upon land fronting Bridgford-road, of a building, for use as offices. Names to Mr. Wm. Pare, engineer and surveyor, George-road, West Bridgford, not later than January 19, together with a cheque for 1*l.* 1s.

JANUARY 19.—**Workington.**—RENOVATION.—For the painting and decorating, plumbing and ventilation, and joiner's work required in the renovation of the Congregational Church, Workington, for the Trustees. Bills of quantities, etc., can be obtained on application to Messrs. Stoker & Nicholson, architects and surveyors, 62, Pow-street, Workington, who will receive sealed tenders, endorsed "Church," up to noon on January 19.

JANUARY 19.—**Workington.**—ALTERATIONS.—For alterations to the Furnace Arms beerhouse, Low William-street, Workington. Names and addresses to Mr. Wm. Carmichael, architect, 107, Duke-street, Whitehaven, by January 19, naming the work for which applicants propose to tender.

JANUARY 21.—**Northfield.**—WALL.—King's Norton and Northfield U.D.C. invite tenders for taking down and re-erecting in brick the wall in front of the West Heath Hospital, near Northfield. Bills of quantities and forms of tender may be obtained at the office of the Engineer and Surveyor to the Council, Mr. Ambrose W. Cross, A.M.Inst.C.E., No. 23, Valentine-road, King's Heath, on payment of a deposit of 1*l.* 1s. Plans and specifications may be seen at the said offices, 23, Valentine-road, King's Heath. Sealed tenders, endorsed "Tender for Brick Wall at West Heath Hospital," must be sent to Mr. Edwin Docker, Clerk to the Council, 10, Newhall-street, Birmingham, not later than 12 o'clock noon on January 21.

JANUARY 22.—**Bexley.**—WALL.—For the construction of a retaining wall, 60 ft. in length, average height, 5 ft. Apply to Dr. Searle, Bexley, not later than January 22.

JANUARY 22.—**Burnley.**—GOODS SHED.—The Directors of the Lancashire and Yorkshire Railway invite tenders for the construction of a goods shed and extension of offices at Burnley (Bank Top). Plans can be seen, and form of tender and specification obtained, on application at the engineer's office, Hunts Bank, Manchester. Tenders, endorsed "Tender for Construction of Goods Shed and Extension of Offices at Burnley," to be in the hands of Mr. R. C. Irwin, Secretary, Hunts Bank, Manchester, not later than 10 o'clock on the morning of January 22.

JANUARY 22.—**Navan.**—CONVENT BUILDINGS.—Tenders are invited for the erection of a new wing and chapel at the Convent of Mercy, Navan, according to plans and specifications prepared by Mr. Thomas F. M'Namara, architect, 50, Dawson-street, Dublin. Bills of quantities to be obtained from Mr. D. W. Morris, surveyor, 68, Harcourt-street, Dublin. Tenders to be posted to the Reverend Mother, Convent of Mercy, Navan, not later than January 22.

* JANUARY 22.—**West Ham.**—WALLS, ETC.—West Ham B.C. invite tenders for (1) construction of retaining wall, etc., at Prince Regent's-lane, Plaistow; (2) additional lavatory accommodation, cloak-rooms, and other sundry alterations, Town Hall, Stratford. Plans may be seen, and specifications, form of tender, etc., obtained, at the office of the Borough Engineer, Town Hall, Stratford, on and after January 10. Tenders, endorsed "Tender for (1) Retaining Wall, Prince Regent's-lane; (2) Alterations, Town Hall," to be sent to Town Clerk, Town Hall, West Ham, E., not later than 4 o'clock, January 22.

JANUARY 23.—**Barnsley.**—ALTERATIONS.—Alterations to business premises, George-yard, Barnsley, for Mr. G. Butterfield. Plans may be seen, and quantities obtained, at the offices of Mr. Ernest W. Dyson, architect and surveyor, 10, Regent-street, Barnsley, from January 17 to January 23, when tenders are to be delivered to the architect.

JANUARY 23.—**Consett (Durham).**—HOUSES.—For erection of two houses at Castleside, for Mrs. Newton. Plans, etc., may be seen at the office of Mr. Thos. H. Murray, architect and surveyor, Consett. Tenders to be sent in by January 23, endorsed "Tender for Houses, Castleside."

JANUARY 23.—**Machen.**—SCHOOL.—Monmouthshire Education Committee invite tenders for proposed Council School at Machen to accommodate 550 children. Names and addresses to Mr. C. Dauncey, Secretary, County Council Offices, Newport, Mon., by January 23, together with a deposit of 3*l.* 3s.

* JANUARY 23.—**Wisbech.**—SHOP, ETC.—Tenders are invited for rebuilding shop and premises in High-street, Wisbech. Tenders may be for part or all of the following works:—(1) New double-fronted shop window; (2) rebuilding arcade with basement; (3) new block of premises. Plans can be seen, and particulars obtained, from Mr. W. H. H. Davis, Wisbech. Applications by January 23.

* JANUARY 23.—**Worthing.**—FREE LIBRARY AND MUSEUM.—Worthing Corporation invite builders desirous of tendering for the erection of a free library and museum to send their names to the Town Clerk on or before 12 o'clock noon on January 23. Drawings may be seen at the Town Clerk's office, Worthing, on January 24, 25, and 26, and after at the architect's office, Mr. Henry A. Couch, A.R.I.B.A., 12, Gray's Inn-square, W.C.

JANUARY 24.—**Bristol.**—ALTERATIONS, ETC., TO SCHOOL WORKSHOP.—Bristol Education Committee invite tenders for alterations and additions to the workshop at the day industrial school, Temple Backs. The plans may be inspected at the office of Mr. Peter Addie, at the Council House, and on payment of a deposit of 1*l.* 1s. Tenders, duly endorsed, must be delivered at the office of the Education Committee, Guildhall, before 10 a.m. on January 24.

JANUARY 24.—**Ludworth.**—SCHOOL.—The Derbyshire Education Committee invite tenders for the erection of Ludworth Council School, to accommodate about 250 children. Drawings, specification, etc., may be seen at the office of the Architect to the Committee, Mr. George H. Widdows, A.R.I.B.A., St. Mary's Gate, Derby. A copy of the bill of quantities, etc., can be obtained at the Architect's office upon payment of 1*l.* 1s. Sealed tenders, in envelopes provided for the purpose, endorsed "Tender for New Council School, Ludworth," must be delivered to the Architect at his office not later than 5 p.m. on January 24.

JANUARY 24.—**Swansea.**—REBUILDING.—For the rebuilding of the Hotel Cameron, High-street, Swansea. Names and addresses to Mr. Charles T. Ruthen, architect, Swansea (together with a deposit of 2*l.* 2s.), before January 24.

* JANUARY 25.—**Loughton.**—SCHOOL.—The Essex Education Committee invite tenders for the erection and completion of a girls' secondary school for about 200 pupils at Alderton Hall-road, Loughton, Essex. Plans, specification, and form of contract may be inspected at the office of the architect, Mr. Herbert Tooley, A.R.I.B.A., Warwick House, Buckhurst Hall, between 10 and 5 o'clock any working day, except Saturday. Builders desirous of tendering must send their names and addresses on or before Friday, January 25, to the Clerk to the Committee, together with 5*l.*, for which bills of quantities and form of tender will be sent. Any tender accepted is subject to approval of the Essex C.C. and the Local Government Board.

JANUARY 25.—**Thatcham (Berks).**—PREMISES.—For pulling down old buildings and erecting new premises at Thatcham, for Messrs. A. & T. Brown. Plans, etc., may be seen at the office of Mr. Walter H. Bell, architect, The Market-place, Newbury, where tenders are to be sent by 12 noon on January 25.

JANUARY 26.—**Abercrave.**—HOUSES.—The erection of fifteen houses at Abercrave, Swansea Valley, for the Abercrave Colliery Company. Plans and specification may be seen at the Colliery Offices, Abercrave, or at the offices of the architect, Mr. J. Cook Rees, Neath. Sealed tenders to be sent to the Abercrave Colliery Company, Abercrave, Swansea Valley, on or before January 26, endorsed "Tender for Fifteen Houses."

JANUARY 26.—**Claremadden.**—COTTAGE.—Portumna R.D.C. will, at their meeting to be held on January 26, receive and consider tenders for the building of one labourer's cottage, in the Townland of Claremadden, on the land of Colonel Nolan, the number of plot on map being 21, in accordance with plan and specification, to be seen at office of Mr. M. Lavan, Clerk to Council, Union Workhouse, Portumna. On same date tenders will be considered for the fencing of the undermentioned plots:—No. 1, 2, 3, 4, 5, and 6, Portumna (Mr. T. M'Donagh's land); No. 10, Portumna (Mr. T. M'Donnell's land); No. 22, Fahy (Mr. Ryder's land).

JANUARY 28.—**Bootle.**—PUBLIC CONVENIENCE.—The Corporation of Bootle invite tenders for the construction of public convenience on the south-east side of the canal, Stanley-road. Plans and specification may be seen, and bills of quantities obtained, at the office of the Borough Engineer. Tenders, sealed and endorsed "Tender for Stanley-road Convenience," to be delivered at office of Mr. J. Henry Farmer, Town Clerk, Town Hall, Bootle, not later than 10 a.m. on January 28.

JANUARY 28.—**Pye Nest.**—MISSION ROOM.—The various works required in building a mission room at Pye Nest. Plans and specifications may be seen, and bills of quantities obtained, at offices of Messrs. Jackson & Fox, architects, 7, Rawson-street, Halifax, from January 21 to 28, on which last-named day sealed tenders must be delivered not later than 12 noon.

JANUARY 30.—**Sunderland.**—COTTAGE HOMES.—The Guardians of the Poor of Sunderland Union invite tenders for the erection of cottage homes at the north-east corner of the Workhouse grounds, Hylton-road, Sunderland. Plans may be seen, and bills of quantities obtained, on depositing 2*l.* 2s., at the offices of Messrs. T. & T. R. Milburn, F.R.I.B.A., architects, 20, Fawcett-street, Sunderland. Sealed tenders, endorsed "Cottage Homes," must be delivered at the Union Offices, 17, John-street, Sunderland, before noon on January 30.

JANUARY 30.—**West Crewkerne.**—ADDITIONS TO SCHOOL.—Somerset C.C. Education Committee invite tenders for additions and improvements to the West Crewkerne Clapton Council School. Plans and specification can be seen at the school, and further information can be obtained, from Mr. A. J. Pictor, Bruton. Sealed tenders must reach the County Education Office, Weston-super-Mare, not later than 12 noon on January 30.

FEBRUARY 1.—**Cutsyke.**—CABIN.—The Directors of the North-Eastern Railway Company invite tenders for the erection of a signal cabin at Cutsyke, near Castleford. Plans, etc., may be seen at the office of the Company's Engineer, Mr. W. J. Cudworth, at York, and detailed quantities and form of tender may be obtained on personal application. Sealed tenders, marked "Tender for Signal Cabin at Cutsyke," to be sent to the Chief Engineer, North-Eastern Railway, York, not later than noon on February 1.

FEBRUARY 1.—**Over Alderley.**—SCHOOL WORKS.—The Administrative Sub-Committee for the Macclesfield and Hayfield Union Area invite tenders for alterations and additions to the school buildings, Over Alderley. Plans and specifications can be seen at the office of Mr. H. Beswick, County Architect, Newgate-street, Chester, and quantities obtained on deposit of 1*l.* Tenders are to be sent to Mr. J. Fred. May, Clerk to the said Committee, Macclesfield, on or before February 1, endorsed "Tender for Works at Over Alderley."

FEBRUARY 1.—**Tonyrefail.**—HOUSES AND SHOPS.—The erection of ninety-four houses and seven shops on a site near the New Welsh Navigation Steam Coal Colliery, in the Ely Valley, near Tonyrefail. Plans and specification may be seen at the office of Mr. John Jones, architect, Cilfynydd, Pontypridd, to whom tenders are to be sent on or before February 1. A deposit of 2*l.* 2s. will have to be made prior to the inspection of plans and specifications.

FEBRUARY 2.—**Guildford.**—WORKHOUSE BUILDINGS.—The Guardians invite tenders for the carrying out of certain additions, alterations, and reparations to the old school buildings at the Workhouse, in order to adapt them for use as a relief infirmary. Plans and specification can be seen on application to Mr. Edward L. Lunn, architect, 36, High-street, Guildford. Sealed tenders, endorsed "Building Work at the Old School Block," are to be sent in to Mr. W. S. V. Cullerne, Clerk to the Guardians, at the Union Offices, Commercial-road, not later than 10 o'clock a.m. on February 2.

FEBRUARY 4.—**Edgeworthstown.**—TOWER AND SPIRE.—For the execution of the works comprised in the completion of the tower and spire of the Catholic Church, Edgeworthstown, Co. Longford, for the Very Rev. Canon Martin, P.P., according to the plans and specification prepared by Messrs. Ashlin & Coleman, architects, 7, Dawson-street, Dublin. Bills of quantities have been prepared for the work by Mr. D. W. Morris, surveyor, 68, Harcourt-street, Dublin, and can be obtained from him on payment of 2*l.* 2s. The plans, etc., can be seen at the architects' offices, and at the Presbytery, Edgeworthstown. Sealed tenders, addressed to the architects, to be delivered not later than 12 o'clock noon on February 4.

✱ FEBRUARY 4.—**Near Clandon.**—HOSPITAL.—Builders wishing to tender for erection of small-pox hospital about two miles from Clandon Station, on the London and South-Western Railway, are invited to send their names to the Clerk to the Surrey Smallpox Hospital Committee, County Hall, Kingston-on-Thames, not later than January 22. Plans and specifications may be seen, and forms of tender obtained, from Messrs. Widnell & Trollope, 20, Tothill-street, S.W., or County Hall, Kingston-on-Thames, on and after January 19. Tenders to be delivered to the County Hall on or before noon, February 4.

✱ FEBRUARY 5.—**Burnley.**—COUNTY COURT.—Commissioners of H.M. Works and Public Buildings are prepared to receive tenders for the erection of new County Court at Burnley. Drawings, specification, and a copy of conditions and form of contract to be seen on application at the County Court Office, Burnley. Bill of quantities and form of tender obtainable from H.M. Office of Works. Tenders, endorsed "Tender for Burnley County Court," and addressed to the Secretary, must be delivered before 12 o'clock noon, February 5.

FEBRUARY 5.—**Stornoway.**—POST-OFFICE.—The Commissioners of H.M. Works and Public Buildings invite tenders for a new post-office at Stornoway. Drawings, etc., may be seen on application to the Postmaster at Stornoway. Sketch plans, showing the character of the building, can be seen at H.M. Office of Works, Parliament-square, Edinburgh. Bills of quantities and forms of tender may be obtained on application to Mr. W. T. Oldrieve, on payment of 1*l.* 1s. Tenders must be delivered on February 5, addressed to the Secretary, H.M. Office of Works, etc., Storey's-gate, London, S.W., and endorsed "Tender for New Post-office, Stornoway."

✱ FEBRUARY 6.—**Caterham.**—BATHROOMS.—The Metropolitan Asylums Board invite tenders for remodelling two general bathrooms at Caterham Asylum, Caterham, Surrey, in accordance with drawings, etc., by Mr. W. T. Hatch, M.I.C.E., M.I.Mech.E., Engineer-in-Chief. Drawings, specifications, conditions of contract, etc., can be inspected at the Board's office, Embankment, E.C., on and after the 21st inst. Tenders to be delivered at the Board's office not later than 10 a.m., February 6.

✱ FEBRUARY 6.—**Finsbury.**—SCHOOL.—Trustees of St. Luke's Parochial Schools invite tenders for alterations and additions to their school in Old-street, Finsbury, E.C. Drawings, etc., may be seen, and bills of quantities, with forms of tender obtained, from Messrs. Mark W. King & Sons, 6, Holborn-viaduct, E.C., on and after January 28. Tenders to be delivered, addressed to the Secretary, St. Luke's Schools, Old-street, Finsbury, E.C., before 12 noon on February 6.

✱ FEBRUARY 6.—**Manchester.**—SCHOOLS.—The Manchester Education Committee invite tenders for the erection of the Grange-street special Municipal School, Bradford, and the Devonshire-street Municipal School, All Saints', Manchester. Plans may be seen, and a copy of the bills of quantities (including specification) obtained, on and after January 24, at the Education Offices, Deansgate, Manchester, on payment of 2l. 2s. Tenders, on the official forms, must be delivered not later than February 6.

✱ FEBRUARY 6.—**Willesden.**—RECEIVING HOUSE.—The Guardians of the parish of Willesden invite tenders for the erection of a receiving house for children, in Acton-lane, Willesden, N.W. Bills of quantities and form of tender obtainable, and specifications and drawings can be inspected from January 21 to 23, between 10 a.m. and 4 p.m., upon application to the architect, Mr. Saxon Snell, F.R.I.B.A., 22, Southampton-buildings, Chancery-lane. Tenders, signed and sealed, to be delivered at the Clerk's office, 181, High-road, Kilburn, not later than 12 noon, February 6.

FEBRUARY 7.—**Penketh.**—SCHOOL.—Lancashire Education Committee invite tenders for the erection of a new public elementary school, for 350 scholars, at Penketh, near Warrington. The plans may be seen, and bills of quantities obtained, at the office of the County Architect, Mr. Henry Littler, 16, Ribblesdale-place, Preston, by payment of a deposit of 2*l.* Tenders must be delivered before 12 o'clock noon on February 7, sealed and endorsed, to Mr. G. F. Clarke, Crow-lane West, Earlestown.

FEBRUARY 7.—**Ventnor.**—PAVILION.—Ventnor U.D.C. invite tenders for the necessary works in connexion with the completion of a pavilion at the Pierhead. Plans may be inspected, and copies of the specification, and all other information obtained, at the office of the Surveyor to the Council at Ventnor. Sealed tenders endorsed "Pier Pavilion," must be received by Mr. R. M. Barr Clerk of the Council, Town Hall, Ventnor, I.W., on or before February 7.

FEBRUARY 11.—**Hereford.**—ELECTRIC-LIGHT STATION.—The Hereford T.C. invite tenders for extensions to the buildings at the Electricity Station in Widemarsh-street. Copies of the specification, with general conditions, etc., can be obtained at the office of Mr. John Parker, A.M.Inst.C.E., City Engineer, Hereford, on and after January 19, upon payment of 1*l.* 1s. per copy. Tenders, sealed and endorsed "Tenders for Extensions to Electricity Station," addressed to the Chairman of the Electric Lighting Committee, must be in the hands of Mr. Thomas Lewis, Committee Clerk, Town Hall, Hereford, not later than 6 p.m. on February 11.

No DATE.—**Bristol.**—ALTERATIONS.—Tenders are invited for alterations to No. 22, Cotham New-road, required for the Moravian Mission College. For quantities and further particulars apply to Messrs. La Trobe & Weston, F.R.I.B.A., architects, 44, Corn-street.

No DATE.—**Byker and Scotswood.**—SCHOOL.—Newcastle-upon-Tyne Education Committee invite tenders for the erection and completion of senior, junior, and infants' departments, Bolam-street Council School, St. Peter's-road, Byker; Denton-road Council School, Scotswood. Names, together with 1*l.* 1s. deposit, to the architects, Mr. W. H. Knowles, 25, Collingwood-street, Newcastle-upon-Tyne, for Bolam-street School, and Messrs. Watson & Curry, Pearl-buildings, Newcastle-upon-Tyne, for Scotswood Schools. Plans and specification may be seen at any time at the architects' offices, and bills of quantities will be forwarded to contractors subsequently. Sealed tenders, endorsed "Bolam-street School," and "Scotswood School," should be delivered to Mr. A. C. Coffin, Secretary, Education Offices, Northumberland-road, Newcastle-upon-Tyne, by the date specified in the architects' bills of quantities.

No DATE.—**Chesterfield.**—BUSINESS PREMISES.—For the erection and completion of new business premises, Knifesmith Gate, Chesterfield. Drawings can be seen, and bills of quantities and all information obtained, at the offices of Mr. W. Cecil Jackson, architect and surveyor, 29, Knifesmith Gate, Chesterfield.

No DATE.—**Grimsby.**—VILLA.—For erection of a villa in Humberstone-avenue. Plans may be seen, and quantities obtained, at the offices of the architect, Mr. J. J. Cresswell, A.R.I.B.A., 77, Victoria-street, Grimsby.

No DATE.—**Purston.**—HOUSES.—For the erection of three houses at Purston, near Pontefract (labour only). Apply Mr. C. Atkinson, Lanes Farm, Methley.

No DATE.—**Shiplake.**—HOUSE.—Oxfordshire Standing Joint Committee invite tenders for the erection of a house for a police constable, at Shiplake, near Henley-on-Thames. Plans and specifications on payment of 10s. 6d. Mr. Sidney Stallard, County Surveyor, 8, New-road, Oxford.

No DATE.—**Six Bells, Mon.**—SKITTLE ALLEY, ETC.—Six Bells Club and Institute invite tenders for the laying of a skittle alley and erecting building over same. Plans and specifications may be seen any day between 10 and 5 by applying to the Steward.

ENGINEERING, IRON, AND STEEL.

JANUARY 21.—**Dublin.**—DYNAMO.—Dublin Cleansing Committee invite tenders for two 50 kilowatt three-phase steam dynamos, erected complete at their refuse destructor depôt, Stanley-street, Dublin. Specification may be had at the office of the Committee, 3, Cork-hill, Dublin, on payment of 1*l.* 1s. *Tenders*, to be addressed "Chairman, Cleansing Committee, 3, Cork-hill, Dublin," must be delivered not later than 12 o'clock noon on January 21.

JANUARY 21.—**Manchester.**—WASHERS.—Manchester Corporation Gas Committee invite tenders for the supply, delivery, and erection of two Livesey washers at their Rochdale-road Gas-station. Specification and print can be obtained on application to Mr. C. Nickson, Superintendent, Gas Department, Town Hall, Manchester. Any other information required may be had on application to Mr. J. G. Newbigging, M.Inst.C.E., at his office, Rochdale-road Station, Manchester. Sealed tenders, addressed to the Chairman of the Gas Committee, and endorsed "Tender for Two Washers, Rochdale-road Station," must be delivered at the Gas Offices, Town Hall, not later than 10 a.m. on January 21.

JANUARY 22.—**London.**—RAILS, ETC.—The Directors of Bombay, Baroda, and Central India Railway will receive, up to noon on January 22, tenders for the supply of the following stores, viz.:—(1) Steel rails and fish-plates; (2) cast-iron sleepers, etc.; (3) wheels and axles for carriages and waggons. Tenders must be made on forms, copies of which, with specifications, can be obtained at offices of Mr. W. V. Constable, Secretary, Gloucester House, 2, 3, and 4, Bishopsgate-street Without, London, E.C., on payment of 2*l.* each (which will not be returned).

JANUARY 25.—**London.**—BOGIE CARRIAGES.—The Directors of His Highness the Nizam's Guaranteed State Railways Company, Ltd., invite tenders for the supply of bogie carriages (without wheels and axles), as per specification to be obtained at the Company's offices for the sum of 10s., which amount will not be returned. Tenders to be addressed to the Secretary, marked "Tender for Bogie Carriages," and should reach him not later than noon on January 25. Mr. H. Rendel, Secretary, 268, Winchester-house, 50, Old Broad-street, London, E.C.

JANUARY 29.—**Barking Town.**—LIGHT RAILWAYS (EXTENSIONS).—The U.D.C. of Barking Town invite tenders for the construction of light railways, as follows:—Contract No. 1, rails, fishplates, and bolts; contract No. 2, permanent-way construction; contract No. 3, overhead line equipment. Copies of the specification, etc., may be obtained of Mr. H. Hargreaves, Clerk to the Council, Public Offices, Barking, Essex, on depositing a cheque for 5*l.* 5s. The works are to be carried out in accordance with the plans and specifications prepared by Messrs. Hawtayne & Zeden, of 9, Queen Street-place, London, E.C., Consulting Engineers to the Council, where plans may be seen and from whom further information can be obtained. Tenders, sealed and marked "Tender for Light Railways," to be addressed to the Chairman of the Electricity and Tramways Committee, Public Offices, Barking Town, are to be delivered to the Clerk on or before 12 o'clock noon on January 29.

JANUARY 31.—**Carlton.**—TIMBER BRIDGE.—The West Riding C.C. invite tenders for the erection of a temporary timber bridge over the River Aire, at Carlton, within the R.D. of Skipton. Plans may be seen, and general conditions, etc., obtained, at the office of the Surveyor. A deposit of 1*l.* will be required. Cheques, etc., to be sent to the "West Riding Treasurer," at the County Hall, Wakefield. Sealed tenders, duly endorsed, to be delivered at office of Mr. F. G. Carpenter, West Riding Surveyor, County Hall, Wakefield, not later than 10 o'clock a.m. on January 31.

FEBRUARY 1.—**Cutsyke, Castleford.**—BRIDGE.—The North-Eastern Railway Directors invite tenders for the erection and construction of a new bridge over the Leeds and Pontefract road at Cutsyke, near Castleford. The work comprises a steel bridge, with abutments of concrete, brick, and stone, the abutments being for double line and the superstructure for single line of railway. Plans may be seen, and specification, etc., obtained, on personal application at the office of Mr. W. J. Cudworth, the Company's Engineer, at York. Sealed tenders, marked "Tender for Bridge at Cutsyke," to be sent to the Secretary, at York, not later than noon on February 1.

FEBRUARY 1.—**Scarborough.**—BRIDGE, ETC.—The Directors of the North-Eastern Railway Company invite tenders for the construction of an arch bridge over Westbourne Grove-road, Scarborough; also for coal depôts and platform walls at or near the Company's Washbeck goods yard, Scarborough. Plans may be seen, and specification, etc., obtained, on personal application at the office of Mr. W. J. Cudworth, the Company's Engineer, at York. Sealed tenders, marked "Tender for Bridge and other Works at Washbeck Goods Yard, Scarborough," to be sent to the Secretary, at York, not later than noon on February 1.

✱ FEBRUARY 13.—**Wembley.**—TRAMWAY.—The Light Railways' and Tramways' Committee of the Middlesex C.C. invite tenders for about 1 mile 2 furlongs 5 chains of double track (with road widenings) for electric traction along the Harrow-road, in the Parish of Wembley. Plans, specifications of works, and conditions of contract may be seen, and forms of tender, with bills of quantities, obtained, of Mr. H. T. Wakelam, County Engineer, Middlesex Guildhall, Westminster, S.W., on and after January 21, on deposit of 5*l.* 5s. Tenders, sealed and endorsed "Harrow-road Tramway," must be delivered in sealed envelopes at the offices of Sir Richard Nicholson, Middlesex Guildhall, Westminster, S.W., before 12 noon, February 13.

✱ FEBRUARY 13.—**Willesden.**—TRAMWAYS, ETC.—The Light Railways' and Tramways' Committee of the Middlesex C.C. invite tenders for about 2 miles 1 furlong 6 chains of double track (including the demolition of the existing bridge and the erection of a new steel girder bridge across the L. and N.W. main line at Willesden Junction) for electric traction along Old Oak-lane, Victoria-road, Horn-lane, etc., in the Parishes of Willesden and Acton. Plans, specifications of works, and conditions of contract may be seen, and forms of tender, with bills of quantities, obtained, of Mr. H. T. Wakelam, County Engineer, Middlesex Guildhall, Westminster, S.W., on and after January 21, on deposit of 10*l.* Tenders, sealed and endorsed "Old Oak-lane Tramway," must be delivered in sealed envelopes at the offices of Sir Richard Nicholson, Middlesex Guildhall, S.W., before 12 noon, February 13.

MARCH 20.—**Melbourne.**—STEAM HOPPER BARGE.—The Melbourne Harbour Trust Commissioners invite tenders for the supply and delivery at the Port of Melbourne of one steam hopper barge of 600 tons carrying capacity, including three months' maintenance. Specification, with form of tender, may be obtained at the offices of the Agent-General for Victoria, 142, Queen Victoria-street, London, E.C., on payment of 1*l.* 1s. Sealed tenders, addressed to the Melbourne Harbour Trust Commissioners, must be delivered at their offices, 605 and 607, Flinders-street, Melbourne, Victoria, not later than 12 o'clock noon on March 20.

No DATE.—**Tadcaster.**—PUMP.—Tenders are invited for pump and necessary connexions for supplying kitchen boiler with water from existing tank at the Bilbrough Children's Home. Also for galvanised-iron storage cistern, of about 120 gallons capacity, and small cistern for feeding boiler. For further particulars, apply to Mr. Geo. A. Bromet, Clerk, Union Offices, Tadcaster.

MISCELLANEOUS.

JANUARY 22.—**Leeds.**—FURNISHING OF HOSPITAL EXTENSIONS.—The Guardians of the Leeds Union invite tenders for the general furnishing of two new infirmary blocks at the Workhouse, Beckett-street, Leeds. Names to Messrs. Thomas Winn & Sons, architects, 84, Albion-street, Leeds, not later than January 22, after which date plans and specifications may be seen, and bills of quantities obtained, at the architects' offices.

JANUARY 23.—**London.**—TELEPHONES AND BELLS.—The Metropolitan Asylums Board invite tenders for the installation of telephones and electric bells at the North-Eastern Fever Hospital, St. Ann's-road, Tottenham, N., in accordance with drawing and specification prepared by Mr. W. T. Hatch, M.Inst.C.E., M.I.Mech.E., Engineer-in-Chief. Drawing, etc., may be inspected at the office of the Board, Embankment, London, E.C., and can then be obtained upon payment of a deposit of 1*l.* Tenders, addressed as noted on the form, must be delivered at the office of the Board not later than 10 a.m. on January 23.

JANUARY 25.—**Spondon, Shardlow.**—REMOVAL OF REFUSE, ETC.—Shardlow R.D.C. invite tenders for the removal of night soil, house refuse, etc., in the Parish of Spondon, from February 1, 1907, to January 31, 1908. Forms of tender, etc., can be obtained from, and tenders must be sent to, Mr. J. W. Newbold, Clerk to the Council, Bocket-street, Derby, not later than January 25, endorsed "Scavenging, Spondon."

JANUARY 28.—**Reading.**—CARTING.—Berkshire C.C. invite tenders for daywork carting, and carting of macadam, and other materials for the main roads for the year ending March 31, 1908. Forms of tender, and approximate quantity of material to be carted, to be had at the County Surveyor's Office, Bank-chambers, Cross-street, Reading, or on receipt of stamped addressed foolscap envelope form of tender and particulars will be forwarded. Tenders, endorsed "Tender for Carting," to be sent or delivered to Mr. J. Fred. Hawkins, County Surveyor, on or before January 28.

JANUARY 31.—**Lewisham.**—SCAVENGING, ETC.—Lambeth B.C. invite tenders for the following services for one year from March 31, 1907, namely:—Supply of men, horses, and carts; cartage of materials, etc.; removal of house refuse (for one or three years). Specifications and forms of tender may be obtained upon application to Mr. Henry Edwards, C.E. Sealed tenders, addressed to the Council, and endorsed "Tender," must be delivered at the Town Hall not later than 12 o'clock noon on January 31.

JANUARY 31.—**Redruth.**—LIGHTING.—Tenders are invited by the Redruth U.D.C. for lighting the streets of Redruth, in accordance with specification, which will be forwarded on application. All

tenders to be received by Mr. Henry Paige, Clerk to the said Council, Redruth, on or before January 31.

FEBRUARY 6.—**Wanstead.**—SCAVENGING, ETC.—Wanstead U.D.C. invite tenders:—(1) For weekly collection of household refuse and ashes; (2) for providing water-carts, with horses, harness, and men; (3) for providing carts, with horses, harness, and men, for general cartage, in connexion with the roads, etc. In each case alternative prices are to be quoted, (*a*) for the period of twelve months ending March, 1908; (*b*) for the period of three years ending March, 1910. For further particulars apply at the Council Offices, Wanstead, N.E. (Surveyor's Department), where forms of tender can be obtained, and contract inspected. Sealed tenders to be delivered at the Council Offices not later than February 6.

NO DATE.—**Bramley.**—SINKING PITS.—For sinking two pits. Plans and specifications to be seen at Mr. G. Fitton's, Southfield, Bramley.

NO DATE.—**Pontypool.**—DRIVING A HEADING.—Pontypool Gas and Water Company invite tenders for driving a heading some 400 to 500 yds. long and 8 ft. wide by 7 ft. high, in the mountain limestone and shale beds. Plans and sections can be inspected at the Company's Offices, Clarence-street, Pontypool, and particulars obtained from Mr. T. B. Pearson, Manager and Secretary.

NO DATE.—**South Shields.**—SCHOOL FURNITURE.—The supply of school furniture for the Dean-road School, South Shields. Specification and form of tender may be obtained from the Secretary, Education Office, Ocean-road, South Shields.

PAINTING, etc.

JANUARY 21.—**Selby.**—COLOURING.—For colouring the inside of the administrative block, isolation block, and the pavilion block with two coats of washable colouring at the Selby Joint Isolation Hospital, Selby Common. Further particulars and specification on application to Mr. E. Townend, Clerk, Selby. Sealed tenders to be sent to the Clerk by 3 p.m. on January 21.

JANUARY 23.—**Bootle.**—PAINTING, ETC.—The Corporation of Bootle invite tenders for painting, etc., in connexion with the inside of the Balliol-road Baths. Specification may be seen, and forms of tender obtained, at the office of the Borough Engineer. Tenders, sealed, and endorsed "Painting Balliol-road Baths," must be sent to Mr. J. Henry Farmer, Town Clerk, Town Hall, Bootle, not later than 10 a.m. on January 23.

NO DATE.—**Mossley.**—DECORATION.—The Vicar and Wardens of Mossley Parish Church invite estimates and designs for the decoration of church. Apply Vicar.

ROADS, SANITARY, AND WATER WORKS.

JANUARY 19.—**Cockermouth.**—SEWERING.—For the sewering and drainage, etc., of the Rose Cottage Inn, Cockermouth. Names and addresses to Mr. Wm. Carmichael, architect, 107, Duke-street, Whitehaven, by January 19.

JANUARY 19-23.—**Ferryhill.**—STREET-MAKING.—Street-making and draining at Deanbank, Ferryhill, for the Bishop Auckland Co-operative Society, Ltd. Names to the undersigned on or before January 19. Plans and specifications may be seen, and full particulars obtained, at offices of Mr. F. H. Livesay, architect and surveyor, 107, Newgate-street, Bishop Auckland, up to January 23, upon which date sealed tenders, properly endorsed "Tender for Street-making," are to be sent to the Secretary, Co-operative Stores, Newgate-street, Bishop Auckland, before 12 o'clock noon.

JANUARY 21.—**Alcester.**—BURIAL GROUND.—Alcester P.C. invite plans and specifications for a scheme of laying out the ground, erecting walls and fences, and drainage, in connexion with the provision of a new burial ground at Alcester, together with estimates of the cost of the whole of the proposed works. Full particulars may be obtained from Mr. J. H Bomford, Clerk to the Council, Council Offices, Swan-street, Alcester, to whom plans, etc., must be sent not later than January 21.

JANUARY 21.—**Aylsham.**—DRAINAGE WORK.—Aylsham Guardians invite tenders for certain drainage work at the Aylsham Workhouse, according to a plan and specification, which can be seen at office of Mr. Henry J. Gidney, Clerk to the Guardians, Aylsham. Tenders to be sealed and marked outside "Tender for Drainage Work," and to reach the Clerk by 9.30 a.m. on January 21.

JANUARY 21.—**Campbeltown (Scotland).**—LAYING KERBSTONE.—For laying kerbstone at Hall-street, for the Corporation, in conformity with specification to be seen with Mr. James Fullarton, with whom tenders must be lodged by 10 a.m. on January 21.

JANUARY 21.—**Ossett.**—SEWER.—Ossett Corporation invite tenders for the labour work and materials required in the excavation and laying of 234 lin. yds. of 9-in. earthenware pipe sewer and the building of the necessary manholes and well at the Spa Sewerage Works. Plans and specifications can be seen, and other information obtained, on application to Mr. W. Hirst, Borough Surveyor, at his office, No. 1, New-street, Ossett. Tenders to be sent in, endorsed "Tender for Sewer," to Mr. W. Brook, Town Clerk, on or before January 21.

JANUARY 21.—**Plymouth.**—ROAD WORKS.—The Corporation invite tenders for making-up and completing the following streets and lanes:—Boon's-place; Sidmouth Terrace-lane, No. 1; College Avenue-lane North; Alma-cottages; Ladysmith-road, Section 1; Alice Street-lane, No. 2. Plans and specifications, and conditions upon which forms of tender will be granted, may be seen at offices of Mr. James Paton, Borough Engineer, Municipal Offices, Plymouth, and bills of quantities obtained, after January 16. Sealed tenders must be delivered at the said Offices not later than 5 p.m. on January 21.

JANUARY 22.—**Mansfield.**—SEWER.—For construction of about 170 yds. lin. of 9 in. sanitary pipe sewer, in Chesterfield-road, for the Corporation. Drawings and specifications may be inspected, and bills of quantities obtained, on application at the office of Mr. R. Frank Vallance, F.R.I.B.A., Borough Surveyor. Sealed tenders, on the form supplied, to be sent to Mr. J. Harrop White, Town Clerk, by 5 p.m. on January 22.

JANUARY 22.—**Miskin.**—STREET WORKS.—Mountain Ash U.D.C. invite tenders for the execution of private street works in Hughes-street, Miskin. Plans, etc., may be seen, and form of tender and bill of quantities obtained, on application to the Surveyor to the Council, Town Hall, Mountain Ash. Sealed tenders, prepaid, and endorsed "Hughes-street," to be sent to Mr. H. P. Linton, Clerk to the Council, Town Hall, Mountain Ash, so that they be received not later than 10 a.m. on January 22.

JANUARY 23.—**Burnham (Somerset).**—ROAD WORKS.—The owner of the Rose Farm Estate, Burnham, Somerset, invites tenders for the works in connexion with sewering, forming, levelling, kerbing, channelling, paving, metalling, required in making a new road on the estate. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. Press, engineer and surveyor. Sealed tenders, endorsed "New Road Works," to be delivered at the office of Mr. W. J. Press, 41, College-street, Burnham, Somerset, by 4 p.m. on January 23.

JANUARY 23.—**Desford.**—SEWERS.—Market Bosworth R.D.C. invite tenders for providing and laying about 308 yds. of 9-in. glazed earthenware socket pipe sewers, together with the necessary manholes, etc., settling tank, and filter, at Desford. Plans and specifications may be seen at the residence of Mr. W. M. Sykes, Surveyor to the Council, Chapel-street, Ibstock. Sealed (endorsed) tenders must be sent in to Mr. Frank Bouskell, Clerk to the Council, Market Bosworth, Nuneaton, not later than 10 a.m. on January 23.

JANUARY 23.—**Enfield.**—MAKING-UP.—The U.D.C. of Enfield invite tenders for making-up the private street known by the name of Heathfield-road, Enfield Lock. Plans and specifications can be seen, forms of tender, and all information obtained, on application to Mr. Richard Collins, the Council's Surveyor, at Public offices. Tenders (on the forms supplied only) to be sent in to Mr. T. W. Scott, Clerk to the Council, Public Offices, Enfield, Middlesex, not later than noon on January 23, endorsed "Tender for Heathfield-road."

JANUARY 23-FEBRUARY 12.—**Goole.**—FOOTPATH AND DRAINAGE WORKS.—Goole Joint Burials Committee invite tenders for footpath and drainage works in connexion with cemetery extensions at Goole. Particulars may be obtained not later than January 23, upon application to Mr. Fredk. Chambers, architect and surveyor, Boothferry-road, Goole, on payment of a deposit of 1*l.* 1s. Sealed tenders, properly filled in and addressed on the outside, are to be sent to Mr. James Wm. Johnson, Clerk to the Joint Committee, before noon on February 12.

JANUARY 24.—**Denton.**—ROAD WORKS.—Denton U.D.C. invite tenders for sewering, levelling, paving, metalling, flagging, channelling, and making good the following streets, viz.:—Queen-street, from Manchester-road to the Technical Schools; Lime-grove, from Hyde-road to Annan-street; Annan-street, from Ashton-road to Lime-grove. Drawings and specifications may be seen, and forms of tender or any information obtained, at the office of Mr. Geo. H. Newton, Surveyor to the Council, Town Hall, Denton. Tenders, sealed in an official envelope, to be delivered at the Town Hall, Denton, not later than 12 o'clock at noon on January 24.

JANUARY 24.—**Oxenhope (Yorks).**—WIDENING LANE.—For the work required for the widening of Jew-lane, for the Oxenhope U.D.C. Particulars may be had of Mr. Isaac Feather, surveyor, Oxenhope. Tenders to be sent to the Chairman of the Council by 12 noon on January 24, endorsed "Jew-lane Improvement."

JANUARY 24.—**Sanderstead.**—STREET WORKS.—Croydon R.D.C. invite tenders for the execution of private street works in Kendall-avenue and Edgarroad, Sanderstead. Plans, sections, and specification prepared by the Council's Surveyor, Mr. R. M. Chart, F.S.I., can be inspected, and forms of tender obtained, at his office, Town Hall, Croydon, on payment of 2*l.* Sealed tenders, endorsed "Tender for Private Street Works," must be delivered to Mr. E. J. Gowen, Clerk of the Council, Town Hall, Croydon, before 12 o'clock noon on January 24.

JANUARY 24.—**Tunbridge Wells.**—ROAD IMPROVEMENT WORKS.—Tunbridge Wells Corporation invite tenders for certain works of sewering, widening, kerbing, paving, fencing, etc., to be carried out in connexion with the proposed St. John's-road improvement. The total length of the proposed widening is 600 yds., or thereabouts. Plans, etc., can be seen, and copies of the bill of quantities and any other information obtained, at the office of the Borough Engineer and Surveyor, Mr. W. H. Maxwell, A.M.Inst.C.E. Tenders, endorsed "St. John's-road Improvement," to be sent to Mr. W. C. Cripps, Town Clerk, Town Hall, Tunbridge Wells, on or before 10 a.m., January 24.

JANUARY 28.—**Frimley.**—SEWAGE DISPOSAL.—Frimley U.D.C. invite tenders for the provision, laying, and jointing of cast-iron and stoneware pipe sewers, together with manholes, lampholes, flushing chambers, etc., for Camberley, York Town, Frimley, and Frimley Green Sewerage, Contract No. 2. Drawings, etc., may be seen, and bills of quantities and form of tender obtained, at the offices of the engineers, Messrs. Willcox & Raikes, 63, Temple-row, Birmingham, on payment of a deposit of 5*l.* 5s. Drawings and specification may also be seen at Camberley on application to Mr. F. W. Wright, Resident Engineer's Office, Sewage Disposal Works. Sealed tenders, in the envelopes supplied, endorsed "Camberley Sewerage, Contract No. 2," to be delivered at office of Mr. F. T. S. Marsh, Clerk to the Council, Municipal Buildings, Camberley, Surrey, not later than 12 o'clock noon on January 28.

JANUARY 28.—**Midgley, Sowerby Bridge.**—EXCAVATIONS.—Sowerby Bridge U.D.C. Gas Committee invite tenders for the following:—(1) For about 1,300 yds. of trenching and filling-in for a gas main at Midgley, from Duke-street along Midley-lane to near Town Syke; (2) for the supply and delivery of about 1,300 yds. of 4-in. cast-iron pipes. All tenders to be on the forms prepared, and the work to be done in accordance with the specifications, which can be obtained, with any further information, on application to Mr. A. W. Bissell, Engineer, Gas Works, Sowerby Bridge. Sealed tenders, endorsed (1) "Tender for Excavations," or (2) "Tender for Pipes," to be received by Mr. R. W. Evans, Commercial Bank Chambers, Halifax, not later than 12 o'clock noon on January 28.

* JANUARY 29.—**Ashburton.**—SEWERS.—The Ashburton U.D.C. invite tenders for the construction of about 1150 yds. of sewers, 6 to 15 in. diameter, within the town of Ashburton. Plans can be inspected, and forms of tender and bills of quantities obtained, after January 14, at the office of the Council's Surveyor, and all further particulars from Mr. C. C. Robinson, M.Inst.C.E., the Engineer, Ashburton. Sealed tenders, with prices filled in on bills of quantities, to be delivered, in envelope, endorsed "Tenders for Sewers," to the Clerk to the Council, Ashburton, on or before noon on January 29.

JANUARY 29.—**Derby.**—PERMANENT WAY, ETC.—Derby Corporation Tramways Committee invite tenders for supply and delivery of materials and construction of works in connexion with the permanent way and electrical equipment of a portion of their authorised electric tramways. The length of the route is about two miles, or, reduced to single line, about three and a half miles. The work will be let in one contract—(Contract No. 9). Plans may be seen, and copies of conditions, specification, quantities, with form of tender, relating to the permanent way and electrical equipment, may be obtained on application to Mr. John Ward, M.Inst.C.E., Borough Surveyor and Engineer, and further information relating to the electrical equipment from Mr. T. P. Wilmshurst, M.I.E.E., Borough Electrical Engineer, on payment of the sum of 2*l.* 2s. Sealed tenders, on forms to be supplied, together with the specification and bill of quantities, which must be returned intact, and with all blanks filled up, are to be delivered at the offices of the Town Clerk, Derby, not later than 9 a.m. on January 29, in the official envelope supplied, endorsed "D.C.T.—Contract No. 9—Tender for Permanent Way and Electrical Equipment."

JANUARY 30.—**Kinross.**—DRAINAGE WORKS.—Kinross T.C. invite tenders for the construction of additional drainage works and sewage disposal works for the Burgh. Drawings of the works may be seen, and copies of the specification and schedule of measurements obtained, at the office of Messrs. Buchanan & Bennett, C.E., 12, Hill-street, Edinburgh. An assistant engineer will meet intending offerers at the Town Clerk's Office, Kinross, on January 18, at 11 a.m. Tenders, marked "Drainage Works," are to be lodged with Mr. J. Wilson, Town Clerk, Kinross, not later than January 30.

FEBRUARY 2.—**Chingford.**—MAKING-UP ROADS.—Chingford U.D.C. invite tenders for making-up, paving, sewering, kerbing, lighting, etc., the Alpha-road, Chivers-road, and Ainslie-road West, in accordance with plans and specifications prepared by the Council's Surveyor, Mr. J. T. Griffin, copies of which and form of tender may be obtained on application, and upon payment of 2*l.* 2s. Tenders, which are to be sealed, and endorsed "Tender for Private Street Works," to be delivered to Mr. Leonard C. Bowen, Clerk to the Council, at the Council Offices, Chingford, not later than 12 o'clock noon on February 2.

FEBRUARY 2.—**Prestwich.**—ROAD IMPROVEMENTS.—The U.D.C. of Prestwich invite tenders for the carrying out of works of private street improvement in twenty-one streets, viz.:—Gardner-road and adjacent streets, Deyne-avenue and adjacent streets, and Sherbourne-street, within the U.D. of Prestwich. Conditions of contract can be inspected at the Surveyor's office, Chester Bank, Prestwich, any morning between the hours of 9 a.m. and 11 a.m. The plans, specifications, and quantities of the proposed works will be open for inspection at the office of the Surveyor, Chester Bank. Copies of the bills of quantities and any further information that may be required, can be obtained from the Surveyor on payment of 2*l.* 2s. Tenders must be sent in sealed envelopes, endorsed "Tender for Private Street Works," and must be delivered to Mr. Lewis A. Orford, Law Clerk to the Council, Council Offices, Chester Bank, Prestwich, not later than 10 a.m. on February 2.

FEBRUARY 5.—**Cradley Heath (Staffs).**—CONVENIENCE.—For a public sanitary convenience at Lomey Town, Cradley Heath, for the Rowley Regis U.D.C. Plan, etc., may be seen at the Council Offices, Old Hill, up to February 5. Tenders, endorsed, must be in the hands of Mr. Daniel Wright, Clerk, Council Offices, Old Hill, Staffordshire, by 12 noon on February 5.

FEBRUARY 5.—**Ealing.**—MAKING-UP ROADS.—Ealing T.C. invite tenders for the making-up of the following roads:—Salisbury-road (second portion), Craven-road (portion. The drawings and specification may be seen, and form of tender, together with schedule of quantities and other particulars obtained, from Mr. Charles Jones, M.Inst.C.E., Borough Engineer, Town Hall, Ealing, W., upon payment of a deposit of 1*l.* 1s. for each road. Sealed tenders, in the envelopes provided, endorsed "Tender for Making-up ——," must be delivered at office of Mr. Geo. E. Brydges, Town Clerk, Town Clerk's Office, Town Hall, Ealing, W., not later than 9.30 a.m. on February 5.

FEBRUARY 5.—**Lee.**—ARTIFICIAL STONE-PAVING, ETC.—The Lewisham B.C. invite tenders for metalling the roadway and paving the footpaths with tar-paving and artificial stone (in separate contracts) of part of Manor-lane, Lee. The plans and specifications may be seen, and forms of tender obtained, at the Town Hall, Catford (Surveyor's Department), on and after January 21. Copies of the specification may also be had on payment of the sum of 5s. in each case, which will not be returned. The tenders must be on forms issued by the Council, enclosed in an envelope, sealed, and endorsed "Tender for Manor-lane," and must be delivered by 4 o'clock on February 5, at the Town Hall, and placed in the box there provided for the purpose.

FEBRUARY 9.—**Jassy, Roumania.**—WATER SUPPLY.—The Municipal Council of Jassy invite fresh tenders for the water supply and sewerage of the town of Jassy. All such tenders to be in the Roumanian language, sealed, and to reach the Town Hall by February 9, at 6 p.m. The estimated costs of earthworks, subterranean galleries, iron mains from the source to the town (a distance of 91 kilomètres), distribution, and reservoirs in the town, also for sewerage, is 10,415,000 francs, and a loan of 13½ million francs has been effected to cover the cost. Payments will be made monthly in Roumanian money. Tenders for the whole of the work only will be considered. Necessary guarantee, 420,000 francs. Plans and specifications may be seen, and all further information obtained, at the Chief Engineer's Office, Town Hall, Jassy.

STONE, MATERIALS, AND STORES.

JANUARY 22.—**Norwich.**—BRICKS.—Tenders are invited for 120,000 best Peterborough or Fletton bricks, equal in all respects to the sample No. 507, which may be seen at office of Mr. Arthur E. Collins, M.Inst.C.E., City Engineer, etc., Guildhall, Norwich, delivered when and in such quantities as are required alongside the sewage works in progress between Old Lakenham and Hall-road, Norwich. Tenders, on the forms supplied, enclosed in envelopes, sealed with sealing wax, endorsed "Bricks," and addressed to the Chairman of the Sewerage Committee, must be delivered at Engineer's office not later than 10 a.m. on January 22.

JANUARY 23.—**Great Yarmouth.**—WOOD BLOCKS AND CEMENT.—Great Yarmouth Tramways Committee invite tenders for the supply of 400,000 Jarrah and Karri paving-blocks, and for the supply of 1,000 tons of best Portland cement. Specifications, etc., can be obtained at office of Mr. J. Wm. Cockrill, M.Inst.C.E., Borough Surveyor, Town Hall, Great Yarmouth. Tenders, on the form and in the envelope supplied therewith, are to be delivered at the office of Mr. W. Edgar Stephens, Town Clerk, Town Hall, Great Yarmouth, not later than noon on January 23.

JANUARY 24.—**Denton.**—GRANITE SETTS.—Denton U.D.C. invite tenders for 1,000 tons of granite setts. Forms of tender, or any information, may be obtained at the office of Mr. Geo. H. Newton, Surveyor to the Council, Town Hall, Denton. Tenders, sealed in an official envelope, to be delivered at the Town Hall, Denton, not later than 12 o'clock noon on January 24.

JANUARY 26.—**Durham.**—FLAGS.—Tenders are requested by January 26 for 2½-in. natural face, solid, without luminations, sawn edge flags, to course 2 ft. to 3 ft., per truck load of 60 yds. delivered Durham; no flag longer than 5 ft. or less than 3 ft. City Surveyor, 60, Sadler-street, Durham.

JANUARY 28.—**Cheshunt.**—MATERIALS, ETC.—Cheshunt U.D.C. invite tenders for supplying the following materials, etc., and for cartage work for one year ending March 31, 1908:—(1) Portland cement; (2) grey ground lime; (3) blue lias lime; (4) stoneware pipes, gullies, etc.; (5) Guernsey granite; (6) Kentish flints; (7) local gravel, sand, and hoggin; (9) forage; (10) ironmongery, tools, brooms, etc.; (11) team labour and cartage work; (12) oils and sundries. Particulars and forms of tender may be obtained on application at office, or will be forwarded on receipt of stamped addressed envelope. Tenders, to be delivered in sealed envelopes, endorsed "Tender for ——," as the case may be, addressed Chairman of Council, Manor House, Cheshunt, on or before 5 p.m. on January 28. A deposit of 3*l.* 3s. will be required in the case of Guernsey granite, and 1*l.* 1s. in the case of flints.

JANUARY 28.—**Hastings.**—GRANITE KERBING.—The Corporation invite tenders for 3,000 ft. of granite kerb. Specification, form of tender, and other information may be obtained on application at the office of the Borough Engineer, Mr. P. H. Palmer, M.I.C.E., Town Hall, Hastings. Tenders, under cover, endorsed "Tender for Granite Curbing," to be delivered to Mr. Ben. F. Meadows, Town Clerk, Town Hall, Hastings, not later than 12 o'clock noon on January 28.

JANUARY 28.—**Surbiton.**—MATERIALS.—The U.D.C. of Surbiton invite tenders for the supply of the following materials:—(1) "Quenast" granite macadam; (2) Clee Hill Dhu stone macadam; (3) Guernsey or Norway granite kerbing; (4) Norway granite paving setts; (5) Portland cement, delivered in quantities of at least 3 tons; (6) flare or greystone lime, delivered in quantities of 2 cubic yds. Specifications and form of tender may be obtained on application to Mr. Henry T. Mather, Surveyor to the Council, Council Offices, Surbiton, during office hours. Tenders must be on the forms supplied by the Council, and in endorsed envelopes, and are to be delivered not later than 10 a.m. on January 28.

JANUARY 30-FEBRUARY 9.—**Chelmsford.**—GRANITE.—Essex C.C. invite tenders for the supply of broken granite for the repair of the main roads in the County of Essex, to be delivered at various railway stations and wharves as per schedule, which will be forwarded upon written application to the Chief Surveyor, Chelmsford, on or before January 30. Sealed tenders, in the envelope supplied, to be delivered at the Chief Surveyor's Office, Chelmsford, not later than February 9.

JANUARY 30.—**Hatfield.**—MATERIALS.—Hertfordshire C.C. invite tenders for the supply of the undermentioned materials, cartage, etc., required for the main roads during the year ending March 31, 1908:—Hand-picked surface flints, dug gravel, hoggin, shingle, and sand, team labour. Also for the purchase and removal of road drift accruing from the main roads for the like period. Further particulars and forms of tender can be obtained at office of Mr. Urban A. Smith, M.Inst.C.E., County Surveyor, County Surveyor's Office, Hatfield, and will be sent through the post on receipt of a stamped, addressed foolscap envelope. Tenders, which must be upon the form provided, are to be delivered on or before January 30.

JANUARY 31.—**Ely.**—MATERIAL.—Isle of Ely C.C. invite tenders for the supply of broken materials (granite and iron slag) for the repair of main roads (Northern and Southern Divisions), for the year ending March 31, 1908. Specifications and forms on application to Mr. H. Farr Simpson, County Surveyor, Northern Division, Wisbech; Mr. R. S. W. Perkins, County Surveyor, Southern Division, Ely. Tenders to be sent in before 10 a.m. on January 31.

JANUARY 31.—**Plymouth.**—STORES.—Plymouth Corporation Electricity Department invite tenders for the supply of the undermentioned stores during the twelve months ending March 31, 1908:—(1) Lubricating oils, etc.; (2) engine waste, wipers, etc. Copies of specifications may be obtained on application to the Electrical Engineer not later than January 25, and on a deposit of 10s. for each copy. Sealed tenders, duly endorsed, to be delivered to Mr. E. G. Okell, Borough Electrical Engineer, Prince Rock, Plymouth, not later than January 31.

FEBRUARY 1.—**Halifax.**—MATERIALS.—Halifax Corporation invite tenders for the supply of the following stores and materials required in the undermentioned departments of the Halifax Corporation during the twelve months ending March 31, 1908, viz.:—Highways and Tramways Departments.—Portland cement; stoneware pipes, etc.; oils, paints, etc.; bass brooms; cotton waste; gaskin; gunpowder; iron castings; steel shovels, picks, etc.; ironmongery; team labour; artificial flags; manhole covers; ventilator covers; lamphole covers; gullies; timber; granite; limestone; lime; paving setts (sandstone); paving setts (granite); kerbstones; flags; bricks, puddle, and drain tiles. Forms of tender, specifications, and further particulars may be obtained on application to Mr. James Lord, M.Inst.C.E., Borough Engineer, Town Hall, Halifax. Electricity Department.—No. 1. stores, engine-room stores and ironmongery; No. 2 stores, wrought-iron goods. Schedules of goods and forms of tender may be obtained on application to Mr. W. M. Rogerson, M.Inst.E.E., Borough Electrical Engineer, Foundry-street, Halifax. Tramways Department.—(1) Timber, including wood slipper-blocks; (2) iron and steel; (3) bolts, nuts, washers, screws, nails, cotter-pins, etc.; (4) files; (5) glass; (6) trolley poles, wheels, etc.; (7) lamps, lighting, fittings, etc.; (8) armature repairing and insulating material; (9) anti-friction metal; (10) oils, grease, etc.; (11) paints, varnishes, etc.; (12) paint and varnish brushes, cleaning brushes, etc.; (13) white rag or wipers, waste, wash-leathers; (14) iron brake blocks, iron, malleable and brass castings. Samples may be seen on application at the Stores, Skircoat Depôt. Copies of the specification, etc., may be obtained on application at the General Manager's Office, Skircoat-road, Halifax. Tenders, properly endorsed, must be sent to Mr. Keighley Walton, Town Clerk, on or before February 1. Samples must be marked "Sample, Tender for Stores," and sent to the Borough Engineer, Electrical Engineer, and Tramways Manager, respectively.

FEBRUARY 5.—**Lewisham.**—ANNUAL CONTRACTS.—Lewisham B.C. invite tenders for the following works and supplies:—Road materials; kerb and granite setts; brooms, brushes, etc.; oilman's goods, paints, etc.; ironwork for sewers; cartage and horse hire; shoeing and farrier's work; disinfectants, etc.; sewerage jobbing works; stoneware goods; wheelwright's work; ballast and sand; tar-paving; asphalt; towels, tools; dust blankets; Portland cement, lime, and brick; timber; supply of suction and delivery hose for cesspool vans; supply of sheets for dust carts and tarpaulins; incandescent gas fittings, etc. Specifications and forms of tender may be obtained at the offices of the Borough Surveyor, Town Hall, Catford; or will be remitted on receipt of stamped and addressed foolscap envelope. Tenders, on the forms provided by the Council, enclosed in an envelope, sealed, and endorsed "Tender for ——," are to be delivered at the Town Hall, Catford, and placed in the box there provided for that purpose, on or before 4 o'clock on February 5.

* FEBRUARY 6.—**Chiswick.**—STORES.—The Chiswick U.D.C. are prepared to receive tenders for the execution of work and supply of stores (separately; see advertisement for particulars) for one year commencing April 1, 1907. Forms of tender may be obtained on application, or by sending stamped addressed envelope to Mr. John Barclay, Town Hall, Chiswick, where specimens of goods, etc., may be seen after January 19, between 9-10 a.m. or by appointment. Sealed tenders to be delivered to the Clerk to the Council, Town Hall, Chiswick, not later than 3 p.m., February 6.

FEBRUARY 6.—**Southwark.**—STORES.—Southwark B.C. invite tenders for the following contracts from April 1, 1907, to March 31, 1908:—(1) Asphalt, bitumen, pitch, etc.; (2) ballast, sand, etc.; (3) brooms and brushes; (4) coach ironmongery; (6) cleaning, repairing, and winding clocks and dials; (7) disinfectants; (8) English timber and hardwood; (9) foreign timber; (10) broken granite; (11) harness materials; (12) horse hire; (13) lime, cement, and bricks; (14) linen goods; (15) oils and colours; (16) packing rope, twine, van sheets, etc.; (17) paving, etc.; (18) drain pipes; (20) sewer ironwork; (23) tools, steel, and iron; (24) wheels tyres, etc.; (25) wood blocks (Jarrah). According to the specifications to be seen at the Town Hall, Walworth-road, S.E. Tenders, duly signed, must be sent under cover, and endorsed "Tender for ——," and addressed to the Town Clerk, not later than noon on February 6.

FEBRUARY 9.—**Canterbury.**—MATERIALS.—Canterbury Roads and Survey Committee invite tenders for the supply and delivery of the following materials for one year ending March 31, 1908, viz.:—Hand-broken Guernsey granite, 2 in. gauge; hand-broken Welsh granite, 2 in. gauge; clean ¾ in. and ⅜ in. granite chippings; granite dust; granite channelling, 12 in. by 6 in. flat, granite kerbing, 12 in. by 6 in. edge (Norwegian); quartzite, 2 in. and ¾ in. gauge; stoneware sewer pipes, 12 in., 9 in., 6 in., 4 in. diameter (firsts and seconds); stoneware bends, junctions, and saddlebacks; "Simpson's" patent earthenware street gullies; Portland cement; 5 in. by 3 in. granite setts; 4 in. by 4 in. granite cubes; 4 in. by 4 in. Kentish rag cubes; 6 in. by 6 in. Kentish rag cubes; 6 in. by 8 in. Kentish rag setts; 6 in. by 9 in. Kentish rag setts; 3 in. hard York flags, rough; 3 in. hard York flags, squared; tar macadam, 2 in., 1 in., ¾ in., ⅜ in. Specifications and forms of tender may be obtained on application to Mr. Arthur C. Turley, A.M.Inst.C.E., City Surveyor, City Surveyor's Office, Guildhall-street, Canterbury. Sealed and endorsed tenders, addressed to the Town Clerk, Burgate-street, Canterbury, must be delivered at his office on or before February 9 next.

FEBRUARY 9.—**Chelmsford.**—MATERIALS.—Essex C.C. (Highways, Bridges, and Buildings Committee) invite tenders for the year ending March 31, 1908, for the supply of Norway granite kerb and setts, and York stone edging. Forms of tender, and the special envelope in which the tenders are to be delivered, and all other information and particulars, can be obtained at the Chief Surveyor's Office at Chelmsford. Tenders to be delivered on or before February 9. Mr. Percy J. Sheldon, M.Inst.C.E., Chief Surveyor, Chelmsford.

FEBRUARY 15.—**Folkestone.**—ANNUAL CONTRACTS.—The Corporation invite tenders for the supply of the following goods for the period of one year, namely:—Broken Kentish blue rag, broken flints, rough unbroken rock, Brabourne gravel, Brabourne gravel binding, basalt macadam, Guernsey granite macadam and chippings, or other approved granite macadam, Norwegian granite kerb and channel, Portland cement, drain pipes, Simpson's street gullies, cast-iron goods, iron and ironmongery, paint, varnish, glass, etc.; oil and colourman's stores, miscellaneous stores, brooms and brushes, corn and fodder, carbolic acid, timber, coal. Particulars and forms of tender may be obtained on application to Mr. A. E. Nichols, A.M.Inst.C.E., Borough Engineer and Surveyor, Corporation Offices, Folkestone. Tenders, endorsed on the envelope "Stone" (or as the case may be), to be addressed to Mr. A. F. Kidson, Town Clerk, Town Clerk's Office, Folkestone, and delivered at the Town Clerk's Office on or before February 15.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*ARCHITECTURAL ASSISTANT	Singapore Municipal Comrs.	2,700 dollars per annum, etc.	Jan. 22
*ASSISTANT INSTRS. IN MANUAL TRAIN. (WOODWORK)	London County Council	80*l.* per annum, etc.	Jan. 26
*FOREMAN CARPENTER	Gdns., St. Giles, Camb rwell	2*l.* 2s. per week	Jan. 28
*CLERK OF WORKS	Hackney Borough Council	3*l.* 3s. per week	Feb. 11

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*BUILDER'S IRONMONGERY, ETC., BATTERSEA PARK-ROAD, S.W.—At the Yard	H. W. Smith	Jan. 22
*BUILDER'S STOCK—At 170 and 171, Railway Approach, Shepherd's Bush	Harold	Jan. 23
*DEALS, BATTENS, ETC.—Great Hall Winchester House, Old Broad-street, E.C.	Churchill & Sims	do.
*NURSERY STOCK, SOUTH WOODFORD—On the Premises	Protheroe & Morris	Jan. 30
*CONTRACTOR'S PLANT AND MACHINERY, LOWER TOOTING—On the Estate	Fuller, Horsey, Sons, & Cassell	Feb. 5
*FREEHOLD BUILDING LAND, WILLESDEN GREEN—At the Mart	Reynolds & Eason	Feb. 13
*BUILDING SITE, CITY OF LONDON—At the Mart	Jones, Lang, & Co.	Feb. 18

LEGAL.—*Continued from page 74.*

clear that the verdict could not stand. He should have liked to have entered judgment for the defendants, but he did not feel justified in doing that as he could not say there was not some evidence fit to be considered by a jury, although he could not at the present moment see that any damages could be recovered by the plaintiff. The jury were, however, the proper tribunal to decide questions of fact, and he could not take upon himself the responsibility of saying there was no case for a jury, and therefore it must go back for a new trial.

Lord Justice Cozens-Hardy, in concurring, said he had never known a clearer case for a new trial. He was exceedingly doubtful whether a farthing damages could be established by the plaintiff.

Lord Justice Moulton also concurred, and the appeal was accordingly allowed, with costs, the costs of the first trial to abide the result of the second.

By the consent of the parties it was arranged that the retrial should take place before a special jury.

ACTION AGAINST BUILDER.

THE case of Chapman *v.* Basley came before Mr. Justice Walton in the King's Bench Division last week on further consideration, the action having been tried recently before his lordship at Leicester.

The action was brought by the plaintiff, a builder, of Leicester, against the defendant, Mr. John Henry Basley, a landowner, for the balance of money alleged to be due under a contract. It appeared that in March, 1903, the plaintiff entered into a contract with the defendant for the erection of a number of shops for a sum of 3,990*l.*, the work having to be done under the supervision and to the satisfaction of the defendant's architect. Plaintiff's case was that a balance of 465*l.* 13s. 9d. for additional work which had been executed by him was due, and he claimed this sum, or, in the alternative, asked for an account. The defendant denied that the work in question had been done and alternatively he said that if the work was done it had been paid for.

Mr. C. A. McCardie appeared for the plaintiff, and Mr. F. Dodd for the defendant.

Mr. McCardie said that when the case was tried before his lordship at Leicester the issues were practically decided in favour of the plaintiff, but in consequence of some points raised by the defendant, his lordship reserved judgment so that he might hear further arguments. The matter in dispute really turned upon a sum which had been paid to the architect by the defendant. The work which was the subject of the contract was practically completed at the end of 1903, only a few items standing over till the early part of 1904. The action was commenced in October, 1905, and now, in January, 1907, it was still pending, the plaintiff being kept out of his money for work done in 1903. He understood the defendant was going to take the case to the Court of Appeal, and if need be to the House of Lords. He submitted the plaintiff should now have judgment entered for him for the amount claimed.

Mr. Dodd said that it was necessary for the satisfaction of the defendant that the particulars which had been asked for should be given, and he denied that they had been demanded for the purpose of delay. Defendant had handed over to the architect a large sum of money, and naturally he did not want to have to pay for the same work twice over. The greater part of the 465*l.* was made up of sums due to other tradesmen.

Mr. McCardie said that sums were due to sub-contractors to whom the plaintiff was liable.

Mr. Dodd denied that plaintiff was liable to those other persons.

His lordship thought the money ought to be paid, but upon the understanding that defendant should be protected from any claims by the various tradesmen who had actually done the work,

Mr. McCardie said he was prepared to give that discharge.

In the result his lordship entered judgment for the plaintiff for the sum claimed, and directed that the question of costs, a stay of execution, and the form of the guarantee to be given to the defendant should stand over until the 28th inst.

Patents of the Week.

APPLICATIONS PUBLISHED.*

25,996 of 1905.—H. A. THOMPSON : *Cranes.*

THIS relates to a crane, and consists of a bedplate with sleepers connected thereto, a turntable pivoted thereon, and a jib and mast hinged to said turntable in combination with guys hinged and pivoted to engage with mast and sleepers.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

26,230 of 1905.—J. NEWALL : *Means or Apparatus for Use in Connexion with the Raising and Lowering of Window Sashes.*

This relates to means or apparatus for controlling the raising and lowering of window sashes, and consists in combination of a rack arranged in the edges of the sash, a casing arranged in the stationary window frame, having a gear-wheel engaging the rack, a pinion formed in one with said gear-wheel, a carrier-wheel gearing with the pinion, a second gear-wheel meshing with the carrier-wheel, a coiled spring capable of being wound up by the wheels, a pivoted catch engaging the teeth of the wheel gearing into the rack for locking the parts in position, and a key for operating the catch and for locking it in position.

668 of 1906.—W. MEAKIN : *Locks and Night Latches.*

This relates to locks and night latches, consisting of a series of tumblers or levers, a locking-bolt actuated by a spring, a cylinder revolving in suitable bearings in the lock case, said cylinder being slotted throughout its length to receive a flat key and partly cut away to allow the key to act on the levers, the cylinder being also furnished with an arm to act on the spring bolt.

1,263 of 1906.—G. G. BRODIE and A. B. COLEMAN : *Kitchen or Cooking Ranges.*

This consists in connecting the sheet metal parts of kitchen ranges to the cast metal parts of the said kitchen or cooking ranges by making on the cast metal parts parallel rows of non-continuous ribs or incipient flanges, the ribs or flanges of one row coinciding with the spaces between the ribs of the adjacent row and engaging the edges of the sheet metal part with the said ribs or incipient flanges of the cast metal parts, and in the combination therewith of means for preserving or fixing the sheet metal in its engagement with the ribs or incipient flanges of the cast metal parts.

4,027 of 1906.—COWANS, SHELDON, & CO., LTD., and J. W. BRANSTON and J. C. LOVE : *Luffing Gear for Jib Cranes.*

This relates to jibs and similar cranes, and consists in the arrangement of a sliding block guided on the jib and carrying the rope or chain or pulley or pulleys, the said block being held by a rope led round a pulley on the jib end and anchored to the crane whereby the load is maintained at any desired elevation regardless of the increased or decreased radial action of the jib.

4,440 of 1906.—W. DYE : *Chimney Cowls.*

This relates to chimney cowls, and consists in the combination and arrangement of parts whereby the rising foul gases can have access to the atmosphere through the upper and lower mouths of vertical cylinders carried by a cross cylinder fitted with a door for cleaning purposes, said cross cylinder being carried by the main vertical cylinder, and the exit vertical cylinder being carried by the main vertical cylinder, and provided with rotatory fans at their upper mouths.

6,138 of 1906.—A. BROWN and H. C. PRUCE : *Locks and Latches.*

This relates to latch bolts of that type in which the bolt swings upon a pivot, and consists in supporting the bolt by a suspension-link pivoted at one end to the said bolt, and at the other end to the lock casing, or other fixed part at a point forward of the bolt pivot pin.

9,382 of 1906.—W. H. THORNE : *Door Brake or Check and Holder Designed to Prevent the Banging of Doors.*

This relates to a door brake or check designed to prevent the banging of doors, by the principle of pressure either upon or underneath or a combination of both pressures, on a semi-circular plate to be affixed to a door frame by means of an apparatus to be affixed to a door, said pressure being regulated at will by a tension screw or the like resulting in complete control over the movements of a door.

9,723 of 1906.—F. E. HUEY and W. C. LOVEJOY : *Door-closing Apparatus.*

This relates to a door-closing apparatus, and consists in the combination with a fixed lower door, a pivoting member, an upper door pivoting member having a web provided with an inclined upper side, and a clearance notch or recess, a door having a recess in its lower inner casing for the reception of the said web, plates on opposite sides of the door, and a clamping device for the said plates, cleared by said notch or recess in said web.

17,964 of 1906.—G. T. RICHARDSON : *Method of Constructing Reversible Fanlights, Casements, Sashes, Doors, and the like.*

This relates to a supporting movable frame for reversible fanlights and the like, comprising two pairs of arms or supports connected at their upper ends by a bar, and between which the fanlight or fanlights is or are arranged, the said arms being free to swing inwards and not outwards, and the arms of each pair being hinged or jointed together at the upper ends, whilst the outer arms of each pair are pivoted at their lower ends to the fixed or enclosed frame.

26,938 of 1905.—J. LINDSAY : *Chimney or Ventilating Shaft Tops.*

This relates to chimney or ventilating shaft tops. The shaft when in the form of a metal tube is telescoped within a top revolving outer tubular portion. The said revolving top has upright or other disposed vanes fixed to the outside thereof so as to catch the wind and revolve it. The inner side of the said top has also vanes fixed thereto, the arrangement being such that as the top is revolved by the outer vanes the inner vanes act as propellers to draw up the smoke and cause an efficient draught. The revolving top is supported by means of a central spindle fixed to the shaft in any convenient manner.

2,223 of 1906.—S. MINGAZZI : *Scaffolding.*

This relates to scaffolding for carrying on, repairing, or other works outside buildings of all kinds, and consists in constructing the uprights of iron tubes for the purpose of making the whole scaffolding lighter and firmer and more handy.

3,353 of 1906.—C. H. SANKEY : *Manufacture of Silica Fireproof, Non-conducting, Sound-resisting or Porous Bricks, Tiles, Lumps, and other articles.*

This relates to the manufacture of bricks, tiles, lumps, and other articles from a mixture of calcined and finely-ground silica, ground or crushed coke, a fibrous combustible material, silicate of soda or other suitable material, and flux and water, and consists in binding these together in a plastic mass by means of flux and water and then moulding the resultant mass under high pressure, and finally drying the articles produced.

11,147 of 1906. G. F. MILLER and O. FROMME : *Packing of Pipe Joints.*

This relates to packing for pipe joints of all kinds, and is characterised in that a packing-ring of soft metal surrounds the outside of the pipes to be connected and lies with its outer surface against the inner surface of a sleeve fixed on the ends of the pipes, whilst it is held at its under surfaces between annular flanges which are fixed on the pipes, and are, preferably, feather-edged.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

January 3.—By T. WOODS.

Feltham.—1, 2, and 3, High-st., u.t. 27 yrs., g.r. 36*l.*, y.r. 115*l.*	£480

January 9.—By WM. HOLLIS.

Finchley.—22 and 23, Hendon-la., u.t. 66 yrs., g.r. 18*l.* 18s., y.r. 195*l.*	2,000
24, Hendon-la., e.r. 105*l.*, also l.g.r. 5*l.*, u.t. 76 yrs., g.r. 15*l.*	1,200
Fortis Green-rd., "Esselmont," u.t. 75 yrs., g.r. 8*l.* 8s., y.r. 45*l.*	450
Station-rd., five freehold building plots	400

January 10.—By BOWYER & JONES.

Derby.—12, Parker-st., f., y.r. 18*l.* 4s.	175

By DANIEL WATNEY & SONS.

Mile-end.—175 to 193 (odd), Jubilee-st., 51 to 57 (odd), Lindley-st.; 22 to 36 (even), Adelina-gr., area 57,000 ft., let on building lease for 80 yrs. at per annum	370

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold, p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

MEETINGS.

FRIDAY, JANUARY 18.

Edinburgh Architectural Association. — Associates' Annual Dinner.

Institution of Mechanical Engineers.—(1) Notice will be given by the Council of proposed alterations to the By-laws. (2) Adjourned discussion on "Lighting of Railway Premises, Indoor and Outdoor," by Mr. H. Fowler. (3) Professor H. C. H. Carpenter, M.A., Ph D., and Mr. C. A. Edwards, of the National Physical Laboratory, on the Eighth Report to the Alloys Research Committee: "On the Properties of the Alloys of Aluminium and Copper." 8 p.m.

SATURDAY, JANUARY 19.

Junior Institution of Engineers.—Visit to Royal Naval College, Greenwich, for inspection of New Engineering Laboratory. 2.30 p.m.

MONDAY, JANUARY 21.

Royal Institute of British Architects.—(1) To read the Deed of Award of Prizes and Studentships for 1906-7; (2) Papers on "Marbles: Their Ancient and Modern Application," by Sir L. Alma-Tadema, O.M., R.A., and Mr. William Brindley. 8 p.m.

Liverpool Architectural Society.—Display of Lantern Slides prepared by members, and discussion. 6 p.m.

London Institution.—Mr. C. Harrison Townsend on "The Art of Pictorial Mosaic." illustrated. 5 p.m.

London County Council School of Building (Ferndale-road, Clapham).—(Lectures and Demonstrations in connexion with stone and wood-carving classes, by Professor Beresford Pite, assisted by Messrs. S. R. Cameron and C. Burgess).—Demonstration—Modelling in the round, a capital or finial in stone or wood. 7.30 p.m.

University of London (South Kensington).—Mr. Banister Fletcher on "Circular Temples and Basilicas of the Romans." 8 p.m.

TUESDAY, JANUARY 22.

Royal Institute of British Architects. — Annual Exhibition of Designs and Drawings submitted for the Institute Prizes and Studentships, in the gallery of the Alpine Club. 10 a.m. to 8 p.m. (Daily until February 2).

Royal Institution.—Professor Percy Gardner on "The Sculpture of Aegina in relation to Recent Discovery." II. 3 p.m.

University College.—"Greek Architecture."—No 2 of a course of ten lectures on "Seven Ages of Architecture," by Professor F. M. Simpson. 8 p.m.

Northern Architectural Association.—Mr. S. Addison Smith on "Specifications and Contracts." 7.30 p.m.

Institution of Civil Engineers.—Mr. J. Tayler Milton on "Internal-Combustion Engines for Marine Purposes." 8 p.m.

WEDNESDAY, JANUARY 23.

Society of Arts.—M. Philippe Bunau-Varilla on "The Isthmus of Panama." Sir J. Wolfe Barry will preside. 8 p.m.

Architectural Association Discussion Section.—Mr. H. Rope on "Water Supply." 7.30 p.m.

Edinburgh Architectural Association (Associates' evening).—"Notes on a Tour in Greece," by Mr. Ramsay Traquair. 8 p.m.

THURSDAY, JANUARY 24.

Royal Institution.—Mr. W. Napier Shaw, M.A., L.L.D., on "Recent Advances in the Exploration of the Atmosphere."—II. 3 p.m.

Institution of Electrical Engineers. — Mr. Clifford C. Paterson on "Investigations on Light Standards and the Present Condition of the High-Voltage Glow Lamp." 8 p.m.

Eastern Counties Federation Master Builders (at 31 and 32, Bedford-street, Strand, W.C.) — Council meeting. 2.30 p.m.

FRIDAY, JANUARY 25.

Architectural Association.—Paper by Mr. R. Clipston Sturgis on "American and European School Architecture." 7.30 p.m.

Glasgow Architectural Craftsmen's Society.—Address by Mr. F. H. Newbery. 8 p.m.

Institution of Civil Engineers (Students' Meeting).—M. C. A. Ablett on "Alternating-Current Commutator Motors." 8 p.m.

Southern Counties Federation Master Builders (at 31 and 32, Bedford-street, Strand, W.C.) — Council meeting. 12 noon.

TERMS OF SUBSCRIPTION.

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.	
Hard Stocks	1	8	0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1	6	0	" " "
Picked Stocks for Facings	2	10	0	" delivered.
Flettons	1	8	0	" at railway depôt.
Red Wire Cuts	1	14	0	" " "
Best Fareham Red	3	12	0	" " "
Best Red Pressed Ruabon Facing	5	0	0	" " "
Best Blue Pressed Staffordshire	3	15	0	" " "
Do. Bullnose	4	0	0	" " "
Best Stourbridge Fire Bricks	3	14	0	" " "
GLAZED BRICKS.				
Best White and Ivory Glazed Stretchers	12	0	0	" " "
Headers	11	0	0	" " "
Quoins, Bullnose, and Flats	16	0	0	" " "
Double Stretchers	19	0	0	" "
Double Headers	16	0	0	" " "
One Side and two Ends	19	0	0	" " "
Two Sides and one End	20	0	0	" " "
Splays, Chamferred, Squints	20	0	0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	" " "
Quoins, Bullnose, and Flats	14	0	0	" " "
Double Stretchers	15	0	0	" " "
Double Headers	14	0	0	" " "
One Side and two Ends	15	0	0	" " "
Two Sides and one End	15	0	0	" " "
Splays, Chamferred, Squints	14	0	0	" " "
Second Quality White and Dipped Salt Glazed	2		0	" less than best.

	£	s.	d.	
Thames and Pit Sand			7	0 per yard, delivered
Thames Ballast			5	6 " "
Best Portland Cement			28	0 per ton, "
Best Ground Blue Lias Lime			19	0 " "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s.	d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½	" "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	1	" "
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	2½	" "

	s.	d.	
Ancaster in blocks	1	10	per ft. cube, deld. rly. depôt
Beer "	1	6	" "
Greenshill "	1	10	" "
Darley Dale in blocks	2	4	" "
Red Corsehill "	2	2	" "
Closeburn Red Freestone	2	0	" "
Red Mansfield "	2	4	" "
YORK STONE—*Robin Hood Quality.*			
Scappled random blocks.	2	10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super., "
6 in. rubbed two sides ditto, ditto	2	6	" "
3 in. sawn two sides slabs (random sizes)	0	11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	" "
1½ in. to 2 in. ditto, ditto	0	6	" "
HARD YORK—			
Scappled random blocks.	3	0	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	8	per ft. super., "
6 in. rubbed two sides ditto	3	0	" "
3 in. sawn two sides slabs (random sizes)	1	2	" "
2 in. self-faced random flags	0	5	" "

SLATES.

In. In.	£	s.	d.	
20×10 best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
20×12 " "	13	17	6	" "
20×10 first quality "	13	0	0	" "
20×12 " "	13	15	0	" "
16×8 " "	7	5	0	" "
20×10 best blue Portmadoc	12	12	6	" "
16×8 " "	6	12	6	" "
20×10 best Eureka unfading green	15	17	6	" "
20×12 " "	18	7	6	" "
18×10 " "	13	5	0	" "
16×8 " "	10	5	0	" "
20×10 permanent green	11	12	6	" "
18×10 " "	9	12	6	" "
16×8 " "	6	12	6	" "

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depôt.
Hip and Valley tiles	3	7	per doz. "
Best Broseley tiles	50	0	per 1000 "
Do. Ornamental tiles	52	6	" "
Hip and Valley tiles	4	0	per doz. "
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	" "
Do. Ornamental do.	60	0	" "
Hip tiles	4	0	per doz. "
Valley tiles	3	0	" "
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 "
Do. Ornamental do.	54	6	" "
Hip tiles	4	1	per doz. "
Valley tiles	3	8	" "
Best "Rosemary" brand plain tiles	48	0	per 1000 "
Best Ornamental tiles	50	0	" "
Hip tiles	4	0	per doz. "
Valley tiles	3	8	" "
Best "Hartshill" brand plain tiles, sand-faced	50	0	per 1000 "
Do. pressed	47	6	" "
Do. Ornamental do.	50	0	" "
Hip tiles	4	0	per doz. "
Valley tiles	3	6	" "

WOOD.

BUILDING WOOD.	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13	10	0	15	0	0
Deals: best 3 by 9	13	0	0	14	0	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	0	0	12	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best.		
Battens: seconds	0	10	0	"		
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	10	0	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	"		
	At per load of 50 ft.					
Fir timber: best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	0	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	10	0	3	0	0
Pitch-pine timber (30 ft. average)	4	0	0	4	15	0

JOINERS' WOOD.	At per standard. £	s.	d.	£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in.	24	0	0	25	0	0
3 in. by 9 in.	22	0	0	23	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	18	0	0
Second yellow deals, 3 in. by 1 in.	18	10	0	20	0	0
" " 3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	13	10	0	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	0	0	12	0	0

WOOD (*continued*).

JOINERS' WOOD—(*continued*)—	At per standard. £	s.	d.	£	s.	d.
Petersburg first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	0	0	14	0	0
Do. 3 in. by 9 in.	12	10	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg— First white deals, 3 in. by 11 in.	14	10	0	15	10	0
" " 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
" " 3 in. by 9 in.	12	10	0	13	10	0
" " battens	10	0	0	11	0	0
Pitch-pine: deals	18	0	0	21	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	44	0	0	upwards.		
Oddments	32	0	0	"		
Seconds, regular sizes	33	0	0	"		
Yellow Pine oddments	28	0	0	"		
Kauri Pine—Planks, per ft. cube	0	3	6	0	5	0
Danzig and Stettin Oak Logs— Large, per ft. cube	0	3	0	0	3	6
Small " "	0	2	6	0	2	9
Wainscot Oak Logs, per ft. cube	0	5	6	0	6	0
Dry Wainscot Oak, per ft. sup. as inch	0	0	8½	0	0	9½
¾ in. do. do	0	0	7	—		
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	0	1	0
Selected, Figury, per ft. super. as inch	0	1	6	0	2	6
Dry Walnut, American, per ft. super. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	22	0	0
American Whitewood Planks, per ft. cube	0	4	0	0	5	0
Prepared Flooring, etc.—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
1 in. by 7 in. " "	0	14	0	0	18	0
¾ in. by 7 in. white " "	0	10	0	0	11	6
1 in. by 7 in. " " "	0	12	9	0	15	0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	7	7	6	7	15	0
Compound Girders, ordinary sections	9	10	0	10	10	0
Steel Compound Stanchions	12	5	0	13	5	0
Angles, Tees, and Channels, ordinary sections	9	5	0	10	5	0
Flitch Plates	9	5	0	10	5	0
Cast Iron Columns and Stanchions including ordinary patterns	8	0	0	9	0	0

METALS.

IRON—	Per ton, in London. £	s.	d.	£	s.	d.
Common Bars	8	10	0	9	0	0
Staffordshire Crown Bars, good merchant quality	9	0	0	9	10	0
Staffordshire "Marked Bars"	11	0	0	—		
Mild Steel Bars	9	5	0	9	10	0
Hoop Iron, basis price	9	10	0	9	15	0
" " Galvanised	17	10	0	—		
("And upwards, according to size and gauge.)						
Sheet Iron Black— Ordinary sizes to 20 g.	10	0	0	—		
" " 24 g.	11	0	0	—		
" " 26 g.	12	10	0	—		
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	14	10	0	—		
Ordinary sizes to 22 g. and 24 g.	15	0	0	—		
" " 26 g.	15	10	0	—		
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	17	10	0	—		
" " 22 g. and 24 g.	18	0	0	—		
" " 26 g.	19	10	0	—		
Galvanised Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	14	10	0	—		
" " 22 g. and 24 g.	14	15	0	—		
" " 26 g.	16	0	0	—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12	0	0	—		
Best Soft Steel Sheets, 22 g. & 24 g.	13	0	0	—		
" " 26 g.	15	0	0	—		
Cut Nails, 3 in. to 6 in.	10	0	0	10	10	0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3lb. and up.	23	0	0	—		
Pipe in coils	23	10	0	—		
Soil pipe	25	10	0	—		
Compo pipe	26	10	0	—		
ZINC—Sheet— Vieille Montagne ton	34	5	0	—		
Silesian	34	0	0	—		
COPPER— Strong Sheet per lb.	0	1	4	—		
Thin " "	0	1	5	—		
Copper nails "	0	1	3	—		
BRASS— Strong Sheet "	0	1	2	—		
Thin " "	0	1	3	—		

LEAD, &c. (*continued*).

		Per ton, in London. £ s. d.		£ s. d.
TIN—English Ingots	„	0 1 11	...	—
SOLDER—Plumbers'	„	0 0 9	...	—
Tinmen's	„	0 0 11½	...	—
Blowpipe	„	0 1 1	...	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d. per ft. delivered.
„ fourths	1¾d. „ „
21 oz. thirds	3½d. „ „
„ fourths	2½d. „ „
26 oz. thirds	4½d. „ „
„ fourths	3½d. „ „
32 oz. thirds	5d. „ „
„ fourths	4½d. „ „
Fluted Sheet, 15 oz.	3½d. „ „
„ 21 oz.	4½d. „ „

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2½d. per ft. delivered.
⅛ „	2½d. „ „
⅛ „	3d. „ „
¼ „	
Figured and Oxford Rolled "Oceanic" Glass, white ...	4d. „ „
Do. „ tinted ...	5½d. „ „

OILS, &c.

		£ s. d
Raw Linseed Oil in pipes	per gallon	0 1 11
„ „ „ in barrels	„	0 2 0
„ „ „ in drums	„	0 2 2
Boiled „ „ in pipes	„	0 2 1
„ „ „ in barrels	„	0 2 2
„ „ „ in drums	„	0 2 4
Turpentine in barrels	„	0 4 3
„ in drums	„	0 4 6
Genuine Ground English White Lead	per ton	25 10 0
Red Lead, Dry	„	24 10 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BOURNEMOUTH.—For constructing conveniences on beach, east and west of pier, for the Town Council. Mr. F. W. Lacey, Borough Engineer and Surveyor, Municipal Offices, Bournemouth:

S. W. Harrison & Co., 13, Temple-street, Birmingham* £2,825

BOURNEMOUTH.—For making-up Jefferson-avenue and Madison-avenue, for the Town Council. Mr. F. W. Lacey, Borough Engineer and Surveyor, Municipal Offices, Bournemouth:—

Grounds & Newton, Bournemouth* .. £223 9 10

CHISWICK.—For the making-up of private streets, for the Urban District Council:—

	Stile Hall-gardens.	Beverley-road.	Blenheim-road.	Abinger-road.	Addison-road.	Geraldine-road.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Surveyor's estimate	1,569 16 9	191 1 4	464 15 8	992 2 8	304 18 4	483 14 0
T. Adams	1,576 0 0	208 0 0	415 0 0	1,010 0 0	271 0 0	519 0 0
J. Ball	1,230 0 0	174 0 0	433 0 0	1,087 0 0	246 0 0	445 0 0
Bower Bros.	1,357 0 0	183 0 0	366 0 0	902 0 0	233 0 0	434 0 0
T. Free & Sons	1,350 0 0	205 0 0	425 0 0	987 0 0	265 0 0	460 0 0
Fry Bros.	1,422 0 0	198 0 0	427 3 10	1,040 5 4	278 0 0	455 15 0
H. J. Greenham & Co.	1,225 0 0	195 0 0	——	——	——	425 0 0
H. Morecroft	——	180 0 0	521 0 0	1,235 0 0	309 0 0	——
W. Morton	620 1 4	208 5 0	——	——	249 14 10	303 5 8
T. J. Nichols	1,417 0 0	195 0 0	443 0 0	1 157 0 0	275 0 0	467 0 0
E. Parry & Co.	1,244 0 0	175 0 0	400 0 0	949 0 0	269 0 0	396 0 0
T. W. Pedrette	1,525 0 0	198 0 0	450 0 0	1 095 0 0	285 0 0	449 0 0
M. N. Rhodes	1,304 11 0	183 18 0	407 19 7	953 16 0	254 17 6	417 9 0
W. E. Rhodes	——	——	364 0 0*	856 0 0*	247 0 0*	——
R. W. Swaker	1.391 11 0	——	597 13 7	1,063 17 6	305 0 0	456 16 6
E. Wall	1,270 0 0	170 0 0	340 0 0	840 0 0	230 0 0	375 0 0
T Watson, jun.	1,472 0 0	——	——	1,021 0 0	——	——
W. H. Wheeler	1,317 0 0	——	——	1,043 0 0	——	——
Wilson, Border, & Co.	1,681 0 0	211 0 0	468 0 0	1,136 0 0	317 0 0	538 0 0
G. Wimpey & Co.	1,220 0 0*	169 0 0*	375 0 0	885 0 0	249 0 0	400 0 0*

CARDIFF.—For additions to the brewery, for Messrs. W. Hancock & Co. Mr. Henry Budgen, F.R.I.B.A.:—

Hatherley & Co.	£2,085 0 0	S. Shepton & Sons	£1,873 17 0
E. Walters & Son	2,038 0 0	D. Davies & Sons	1,820 0 0
F. Small	2,015 0 0	E. Williams	1,810 0 0
G. Hallett	1,980 0 0	W. Thomas & Co., Cardiff*	1,799 0 0
J. Allan	1,975 0 0	F. C. Williams	1,780 0 0
G. Beames	1,965 0 0		
Knox & Wells	1,963 15 6		
W. H. Evans	1,895 0 0		

CHEPPING WYCOMBE.—For an extension of the surface-water drain in Amersham-hill, for the Corporation. Mr. T. J. Rushbrooke, Borough Surveyor, 77, Easton-street, Chepping Wycombe:—

S. Gibbons	£159 1 9	J. Smith	£136 13 0
Hunt & Son	149 0 0	J. T. Harris	129 16 0
Free & Son	146 13 9	A. T. Lee, High Wycombe*	119 0 0
Langley & Johnson	142 11 0		

CHEPPING WYCOMBE.—For making up, channelling, kerbing, etc., of Roberts and Benjamin-roads, for the Corporation. Mr. T. J. Rushbrooke, Borough Surveyor, 77, Easton-street, Chepping Wycombe:—

Roberts-road.

C. H. Hunt & Son	£507 10 0	J. Smith	£403 15 6
Langley & Johnson	427 8 6	S. Gibbons	401 10 10
T. Free & Sons	413 0 0	A. F. Lee, High Wycombe*	396 0 0

Benjamin-road.

C. H. Hunt & Sons	£558 10 0	T. Tree & Sons	£429 7 0
Langley & Johnson	449 8 6	J. Smith	405 17 2
S. Gibbons	437 15 0	A. F. Lee, High Wycombe*	398 0 0

CHESTERFIELD. — For constructing two small shops on the south side of the covered markets, for the Corporation. Mr. V. Smith, Borough Surveyor. Quantities by Surveyor.

A. Denby & Co.	£299 0 0	J. Wright	£219 11 6
J. Collis & Sons	220 0 0	G. F. Kirk, Chesterfield*	197 7 6

DROITWICH.—For new Post Office:—

Stephens, Bastow & Co., Ltd.	£3,209 0 0	J. Wood & Sons, Ltd	£2,847 0 0
T. J. Mason	3,202 11 9	S. E. Spicer	2,817 15 0
F. Evered	3,196 0 0	T. A. Cole & Son	2,763 14 7
B. W. Whitehouse & Sons	3,049 0 0	H. Sapcote & Sons	2,747 0 0
S. J. Small	2,968 0 0	J. Bowen & Sons	2,728 0 0
Tilt Bros.	2,944 0 0	J. Barnsley & Sons	2,688 0 0
W. Jones	2,920 0 0	H. J. Pitts	2,650 0 0
R. Thompson	2,897 10 0	H. Smith, Kidderminster*	2,588 0 0
G. H. Marshall	2,875 0 0	C. Griffiths	2,583 12 0
J. Elvins	2,670 0 0		
J. Dallow & Sons	2,868 0 0		

EASTBOURNE.—For private improvement works in the passages at the rear of Dudley-road, etc., for the Highways, etc., Committee. Mr. A. E. Prescott, Borough Surveyor, Town Hall, Eastbourne:—

M. Hookham	£148 19	A. Hudson	£118 17
J. C. Lacey	127 18	J. Vine*	98 17

[All of Eastbourne.]

EAST COWES.—For road-works, Oakfield Estate, for the Urban District Council. Mr. A. E. Barkton, Surveyor, Town Hall, East Cowes:—

H. E. Day	£1,035	I. Barton	£929
G. F. Quinton	1,028	W. H. Brading & Son, East Cowes	890
J. Ball & Son	965		

GREAT HOUGHTON. — For the erection of a Wesleyan Church and Schools at Great Houghton, near Barnsley. Messrs. Garside & Pennington, architects, Pontefract and Castleford:—

Brickwork: Leadley & Groves, Goldthorpe, Barnsley	£575 10
Slaters: Leadley & Groves, Goldthorpe, Barnsley	80 0
Woodwork: Jeffery & Peace, Batley	430 0
Plumber: J. A. Binns, Cudworth, Barnsley	113 0
Plasterer: W. Platts, Wakefield	31 0
Painter: S. Harrison, Pontefract	40 5

GRIMSBY.—For watermains, for the Corporation. Mr. E. Gilbert Whyatt, Borough Engineer and Surveyor, Town Hall-square, Grimsby:—

J. Sangwin	£369 7 3	Hewins & Goodhand	£209 0 0
E. Tabor	302 10 8	H. Hewins, Grimsby*	192 17 6
D. J. Dolby	221 0 0		

HARROGATE.—For private street works Tewit Well-avenue, for the Corporation. Mr. F. Bagshaw, Borough Engineer and Surveyor, Harrogate:—

E. Long 7, Forest-avenue, Starbeck, Harrogate* £559

HENDON.—For storm-water drainage and paving works, Edgware-road, for the Urban District Council of Hendon. Mr. S. S Grimley, Engineer and Surveyor to the Council:—

	Surface-water Drain, for Stoneware Pipes and Concrete Tubes.	Paving Works.
D. T. Jackson	£4,207 1 1	£1,071 9 0
T. Adams	4,046 12 4	1,125 10 6
T. W. Pedrette	4,039 16 9	1,266 15 0
Bower Bros.	3,965 19 0	1,026 7 9
G. Rutter	3.884 4 1	1,062 13 9
W. Muirhead & Co.	3 842 17 6	1,186 1 6
F. G. Brummell	3,788 15 2	1,056 13 9
J. Moran & Sons	3,630 0 0	1,050 0 0
G. Powdrill	3,625 16 8	1,114 7 9
Pedrette & Co.	3,598 19 3	1,587 12 0
W. Iles	3.570 0 0	1,050 0 0
J. Mowlem & Co.	3,538 0 0	1,147 0 0
F. H. Macdonald	3,519 10 0	985 9 6
T. Watson, Jun., Southall, Middlesex	3,471 6 0	*1,021 6 9
J. Dickson	3,339 2 8	1,287 1 1
E. Haycock & Sons, Great Glenn, near Leicester	*3,018 1 5	1,221 6 3
F. Osenton	2,671 0 0	1,113 15 0

* Recommended by Committee for acceptance, subject to usual enquiries.

HOVE.—For the erection of public library in Church-road, Hove. Mr. H. H. Scott, Borough Surveyor:—

Mr. F. G. Minter, Ferry Works, Putney* £9,999

HOVE.—For the supply of 4,000 ft. of granite kerbing, at 1s. 5d. per ft. lineal, for the Town Council. Mr. H. H. Scott, Borough Surveyor:—

A. & F. Manuelle, 57, Gracechurch-street, London, E.C.*

ILFORD.—For street works, Audley and Oakwood-gardens, for the Urban District Council. Mr. H. Shaw, Surveyor, Town Hall, Ilford:—

Parsons & Parsons, Ilford* £497 3 3

LEAVESDEN (King's Langley).—For two Lancashire steel boilers at schools, for St. Pancras Guardians:—

J. Bellamy Ltd.	£1,610 0 0
Fraser & Fraser, Ltd.	1,600 0 0
P. H. Allin & Sons, Ltd.	1,525 0 0
J. & F. May	1,508 0 0
W. Arnott & Co.	1,470 0 0
Stubbs, Son & Hall	1,457 7 6
Galloways Ltd.	1,423 0 0
D. Adamson & Co.	1,400 0 0
W. Arnold & Co.	1,400 0 0
Watford Engineering Works	1,390 0 0
J. Fraser & Son, Ltd.	1,390 0 0
Oldham Boiler Works Co., Ltd.	1,386 0 0
Spurr, Inman & Co., Ltd.	1,385 0 0
Tinkers Ltd.	1,380 0 0
Clayton, Son & Co., Ltd.	1,322 0 0
J. Foster & Sons	1,300 0 0
E. Danks & Co. (Oldbury), Ltd.	1,295 0 0
Holdsworth & Sons	1,292 0 0
J. & J. Horsfield, Ltd.	1,290 0 0
T. Beeley & Son, Ltd.	1,275 0 0
T. Hill & Sons	1,200 0 0
Hawksley, Wild, & Co., Ltd.	1,200 0 0
J. Thompson, Ettingshall Works, Wolverhampton*	1,175 0 0

LEE.—For supplying and laying artificial stone in High-road, for Lewisham Borough Council. Mr. Ernest Van Putten, Borough Surveyor:—

	Per yd. super. s. d.		Per yd. super. s. d.
Brookes, Ltd.	5 6	J. Ellis & Sons, Ltd.	4 4
J. Mowlem & Co., Ltd.	4 7	Empire Stone Co., Ltd.	4 4
Patent Victoria Stone Co., Ltd.	4 6	Harvey Bros.	4 0
Imperial Stone Co., Ltd.	4 6	Atlas Stone Co., Ltd.	3 8
North Wales Paving Co., Ltd.	4 4	W. Pearce, Forest-hill*	3 5½

LEWISHAM.—For kerbing, channelling, and metalling roadway and paving footpaths of Canonbie-road, etc., Forest-hill, for the Borough Council. Mr. E. V. Putten, Borough Surveyor:—

W. Pearce, Forest-hill (artificial stone, Canonbie-road),* 3s. 6d. per yd. super.; H. Woodham & Sons, Catford (York stone on edge, Canonbie-road),* 9s. per yd. super.; Shap Granite and Patent Concrete Co. (Shap stone, Canonbie-road),* 5s. per yd. super.; W. Pearce, Forest-hill (artificial stone, Sunderland-road),* 3s. 4½d. per yd. super.; W. Pearce, Forest-hill (roadway, kerbing, and channelling, Sunderland-road), £730.

LLANDUDNO.—For alterations and construction of new shops, etc., at the Alexandra Hotel. Mr. T. B. Farrington, architect, Trinity-square, Llandudno:—

E. Thorp & Sons	£1,975 0	G. Roberts & Bro.	£1,885 0
E. Owen	1,940 0	E. Hughes & Son*	1,805 10

[All of Llandudno.]

LONDON.—For the erection of a fireproof store and office at No. 4, Martineau-road, Highbury, for Messrs. J. Lee & Son. Mr. H. W. Rising, architect, 34, Norfolk-street, Strand:—

Calnan	£689	Scowen*	£655
Gibson	664		

LONDON.—For erecting a public library at the junction of the Old and New Kent Roads, for Southwark Borough Council. Mr. Claude Batley, A.R.I.B.A. Quantities by Mr. H. T. Sayer, 44, Gt. Russell-street, W.C.:—

Perry Bros., 21, Whitecross-street, E.C.* £7,200

LONDON.—For the internal alterations to the Adelphi Hotel, John-street, Adelphi, W.C., for Mrs. Burlet. Messrs. Hayward & Maynard, A.R.I.B.A., architects, 20, John-street, Adelphi:—

W. Eyre	£1,998	Olver & Co., Haymarket*	£1,545
W. Read	1,710		

LONDON.—For the erection of new offices on East Wharf, Adelphi, for Mr. G. J. Drummond. Messrs. Hayward & Maynard, A.R.I.B.A., architects, 20, John-street, Adelphi. Quantities by Mr. H. T. Cronk, 9, John-street, Adelphi:—

Macey & Sons	£1,552	Ford & Walton	£1,435
Waller & Co	1,449	Carmichael	1,434
McCormick & Sons	1,445	F. & H. F. Higgs*	1,328

NARBOROUGH (near Leicester).—For farm buildings, roads, shelters, etc., for the Leicestershire and Rutland County Lunatic Asylum Committee of Visitors. Messrs. Everard, Son, & Pick, architects, 6, Millstone-lane, Leicester. Quantities by architects:—

T. Herbert	£11,274 0 0	W. Moss & Sons, Ltd.	£9,857 7 6
W. M. Sharpe	10,900 0 0	J. C. Kellett & Son Leicester*	9,026 0 0
H. Herbert & Sons	10,399 0 0	E. Fox	8,600 0 0
J. E. Johnson & Son	9,990 0 0		

NEW SOUTHGATE.—For the taking down the existing temporary church and re erecting on another portion of the site; also for the erection of new church premises, for the trustees of Springfield-road Primitive Methodist Chapel. Mr. Frank Bethell, architect and surveyor, 23, Queen Anne's-place, Bush Hill Park, Enfield, N. Quantities by the architect:—

W. Reason	£3,196	Jennings & Grenfell	£2,400
F. & T. Thorne	2,844	Thomas & Edge	2,397
E. K. Wilton	2,663	Mattock Bros.	2,287
Steed & Sons	2,631	Winter & Sons	2,265
A. Porter	2,491	Fairhead & Son, Enfield†	2,218
J. Stewart	2,481		
Lawrence & Son	2,474		

OXENHOPE (Yorks.).—For erecting Council offices, for the District Council. Messrs. J. Haggis & Sons, architects, North-street, Keighley:—

Masons: Waddington Bros., Oxenhope	£330 15 0
Joiner: W. Wright, Oxenhope	102 0 0
Slater: W. Tidswell, Denholme	25 0 0
Plasterer: W. Tidswell, Denholme	16 7 2
Plumber: F. T. Raw, Oxenhope	33 18 0
Painter: H. Whitaker, Oxenhope	11 10 6

ROMFORD.—For erecting villa in Forest-road, for Mr. E. C. French, Bow:—

W. Silk & Son, High-street, Homerton* .. £563

[Four tenders received.]

SEGHILL.—For 1,000 yds. of pipe sewers, etc, for the Urban District Council. Mr. J. E. Parker, Engineer, Post Office-chambers, Newcastle-on-Tyne:—

E. & A. Storey	£1,540 14 5	W. Carr	£1,166 0 0
G. Armstrong	1,300 4 6	J. Coxon & Son	1,156 2 3
W. Lant	1,298 3 6	McLaren & McNeil	1,090 0 0
J. Thompson	1,257 17 10	J. Robson, Newcastle*	1,010 3 9
Johnson & Strong	1,204 7 0		

SNAPE.—For alterations, etc., at Snape School, Bedale:—

Mr. T. Chandler, West Tanfield* £296

STIFFORD.—For building a disinfector block and sundry work at the hospital, Long lane, Stifford, for Orsett Joint Hospital Board. Mr. C. M. Shiner, architect, the Gate House, Grays. Quantities by Mr. G. Silvester, 46, Strand, London, W.C.:—

H. E. Davisson	£1,355 14 0	F. Miskin, Ltd.	£1,177 0 0
Myall & Upson	1,283 0 0	F. & G. Foster	1,136 0 0
T. Bruty	1,266 18 6	J. Dobson	1,134 18 9
L. E. Brand & Sons	1,253 4 1	G. Brown	1,125 0 0
Sheffield Bros.	1,240 0 0	E. Pavitt & Sons	1,088 12 0
D. Godden & Son	1,223 19 0	F. Davey	1,081 0 0
W. Potter	1,218 18 6	H. Butcher	1,071 0 0
J. Hammond	1,197 0 0	R. Mead, Little Thurrock‡	1,043 10 9

‡ Accepted subject to quantities.

SWINDON.—For the erection of a mission hall and ten class-rooms at Clarence-street, Swindon, Wilts, for the Wesleyan Methodist Trustees. Mr. W. F. Bird, architect, Midsomer Norton, Somerset. Quantities by the architect:—

J. C. Norman	£5,936 10 0	R. J. Leighfield	£5,608 1 0
H. & C. Spackman	5,917 4 5	Tydeman Bros.*	5,481 2 0

[All of Swindon.]

[Architect's estimate, £5,582.]

WARMINSTER.—For additions to and repairing Fosters, Sutton Veny. Messrs. Long & Glass, architects, Warminster and Frome:—

Wort & Way	£1,525 0	W. R. Moody	£1,071 0
Hodder & Son	1,380 0	A. L. Ponton	1,170 0
G. Moore	1,350 0	J. S. Hibberd, Frome*	1,050 0
R. Butcher & Son	1,219 15		
E. Linzey	1,190 0		

WITHERNSEA.—For erecting three dwelling-houses, South Cliff, for Mr. E. Wrigglesworth. Messrs. Clough & Wrigglesworth, architects, Welton-chambers, Hull:—

Whitelam, Wilson, & Co	£977 14 10	J. R. Nicholson	£823 17 0
Boyes & Oliver	926 18 8	J. Wilkinson	805 11 8
W. H. Beal	885 0 0	J. Richardson	774 6 3½
F. Singleton	857 7 8	G. W. Berridge	774 6 0

WOVERHAMPTON.—For erecting waiting-room, urinal, etc., in Victoria-square, for the Tramways Committee. Mr. G. Green, Borough Engineer, Town Hall, Wolverhampton:—

T. & G. Perry	£399	H. Gough & Son	£360
Willcock & Co	385	R. Kidson	355
F. L. Jones	381	G. Cave & Son*	347
R. Speake & Sons	377		

[All of Wolverhampton.]

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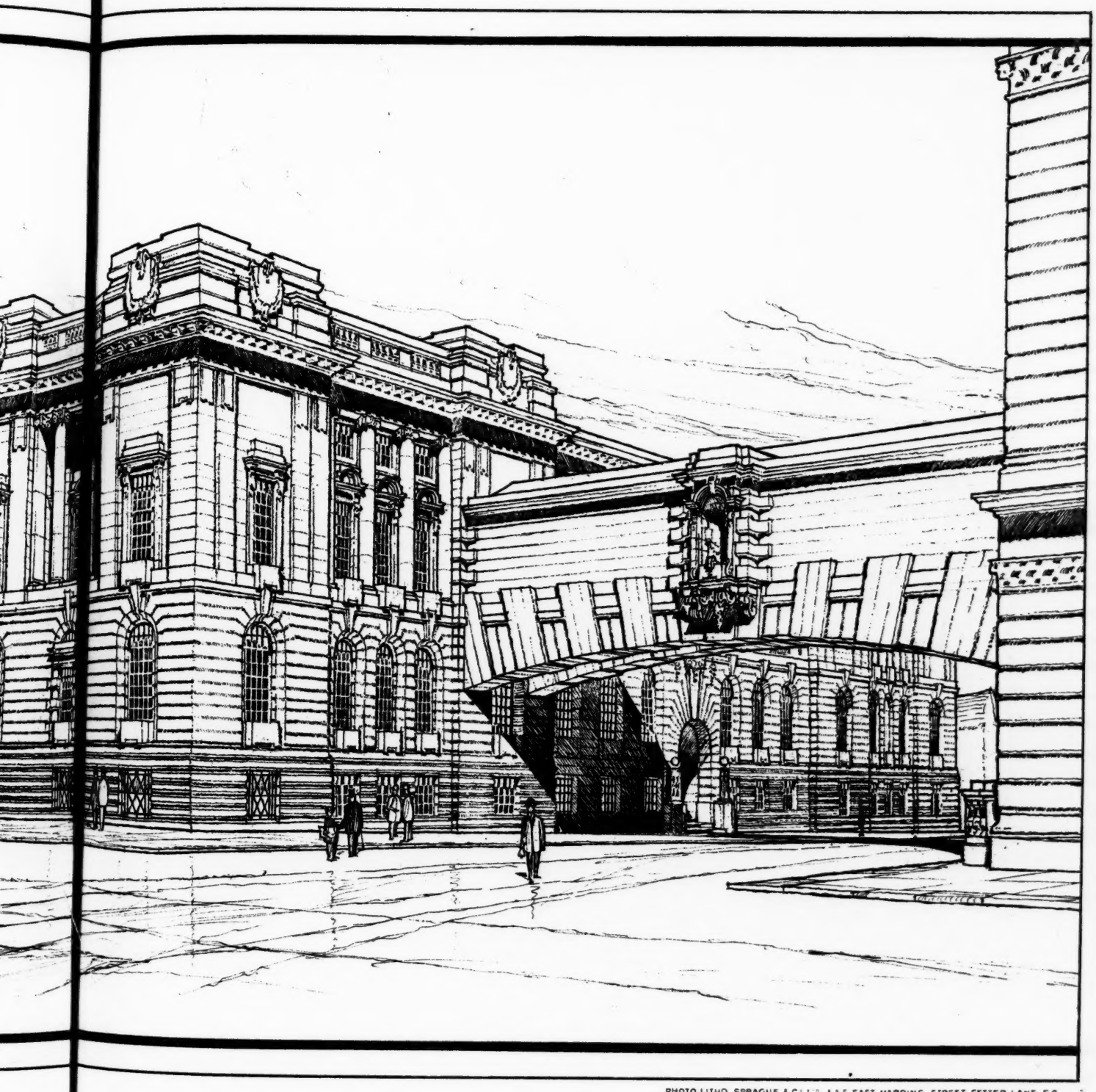
SELECTED DESIGN FOR BIRMINGHAM MUNICIPAL BUILDINGS EXTENSION.

PERSPECTIVE VIEW.



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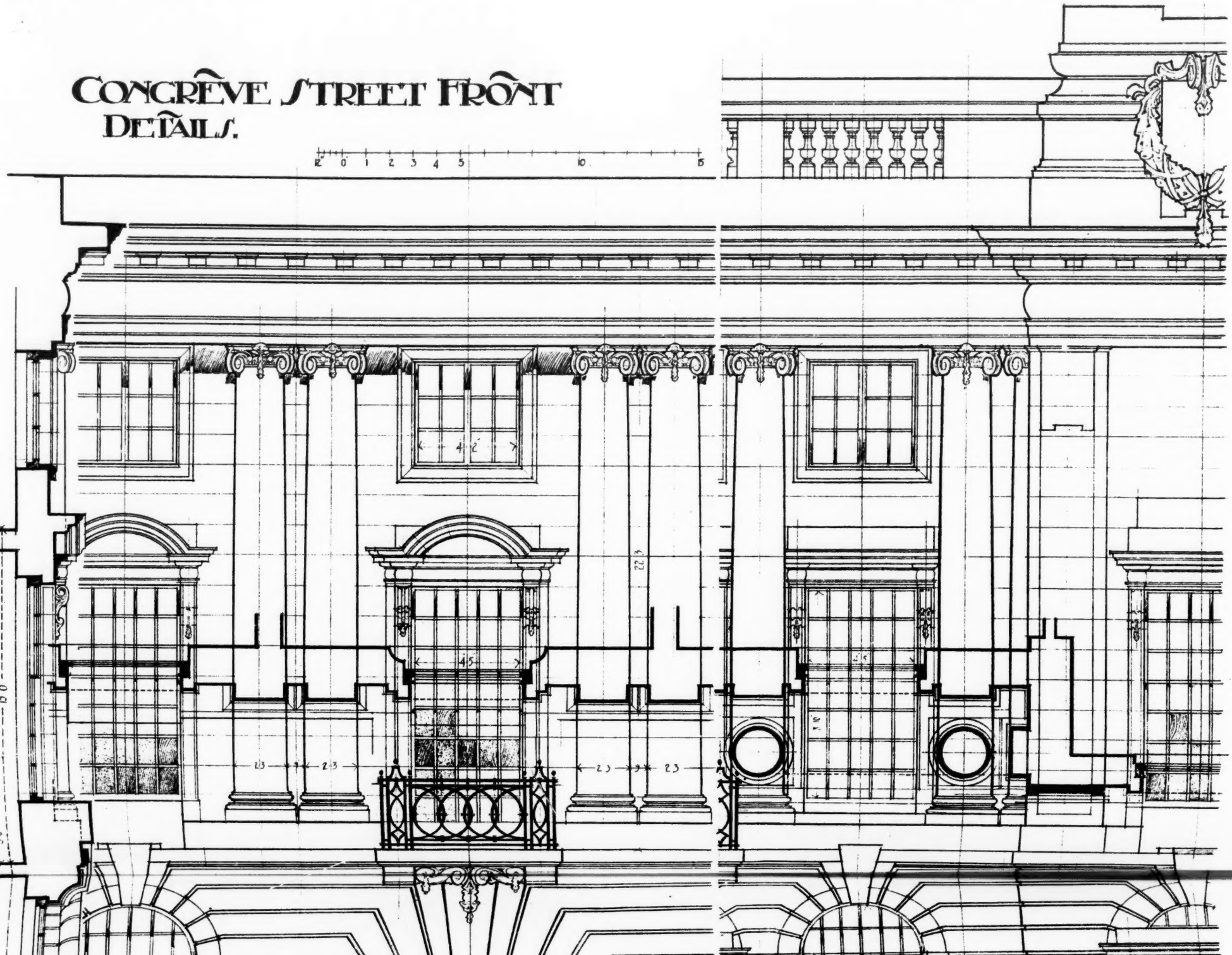
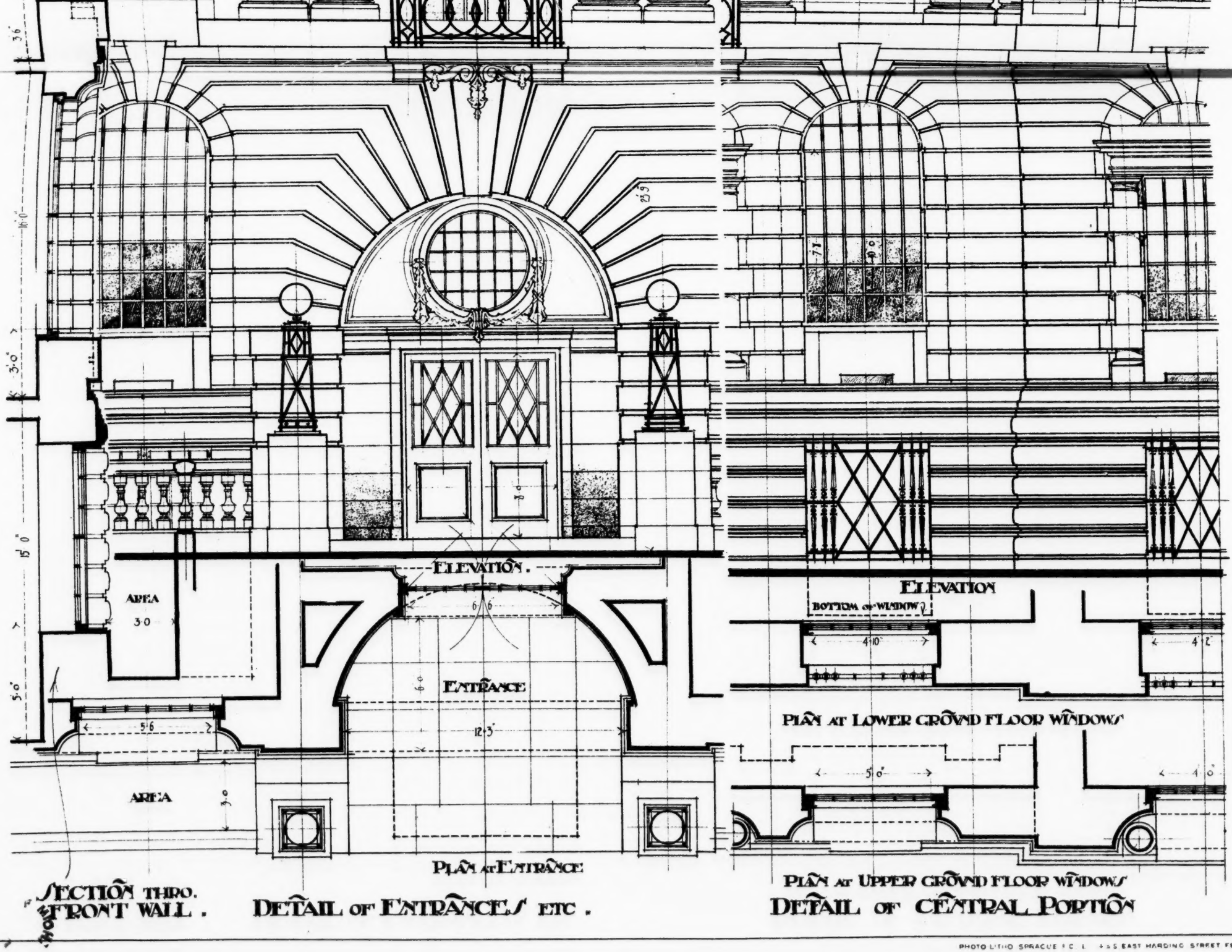
PERSPECTIVE VIEW.

CONCREVE STREET FRONT DETAILS.





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SELECTED DESIGN FOR BIRMINGHAM MUNICIPAL BUILDINGS EXTENSION.—Messrs. Ashley & Winton Newman, Architects

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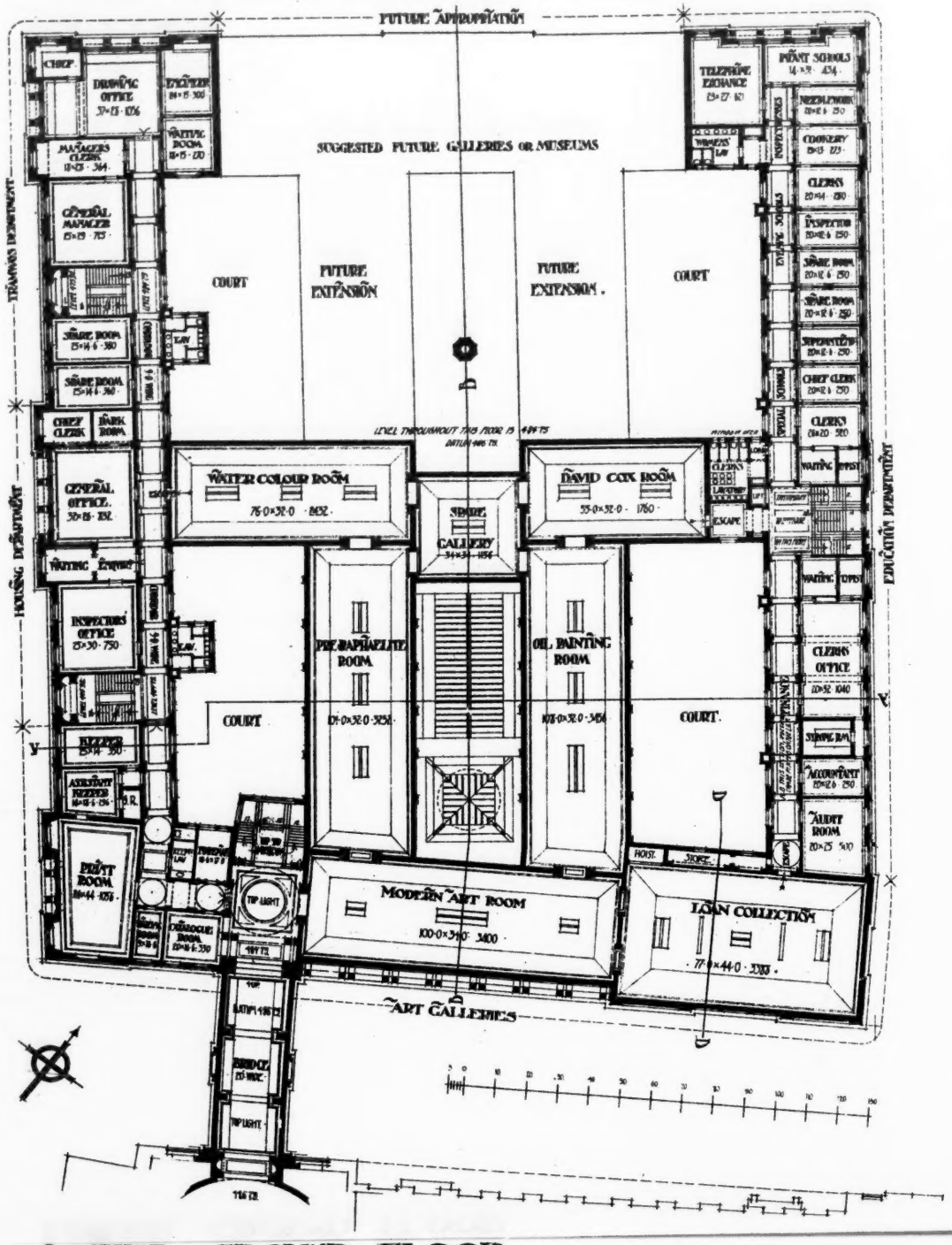
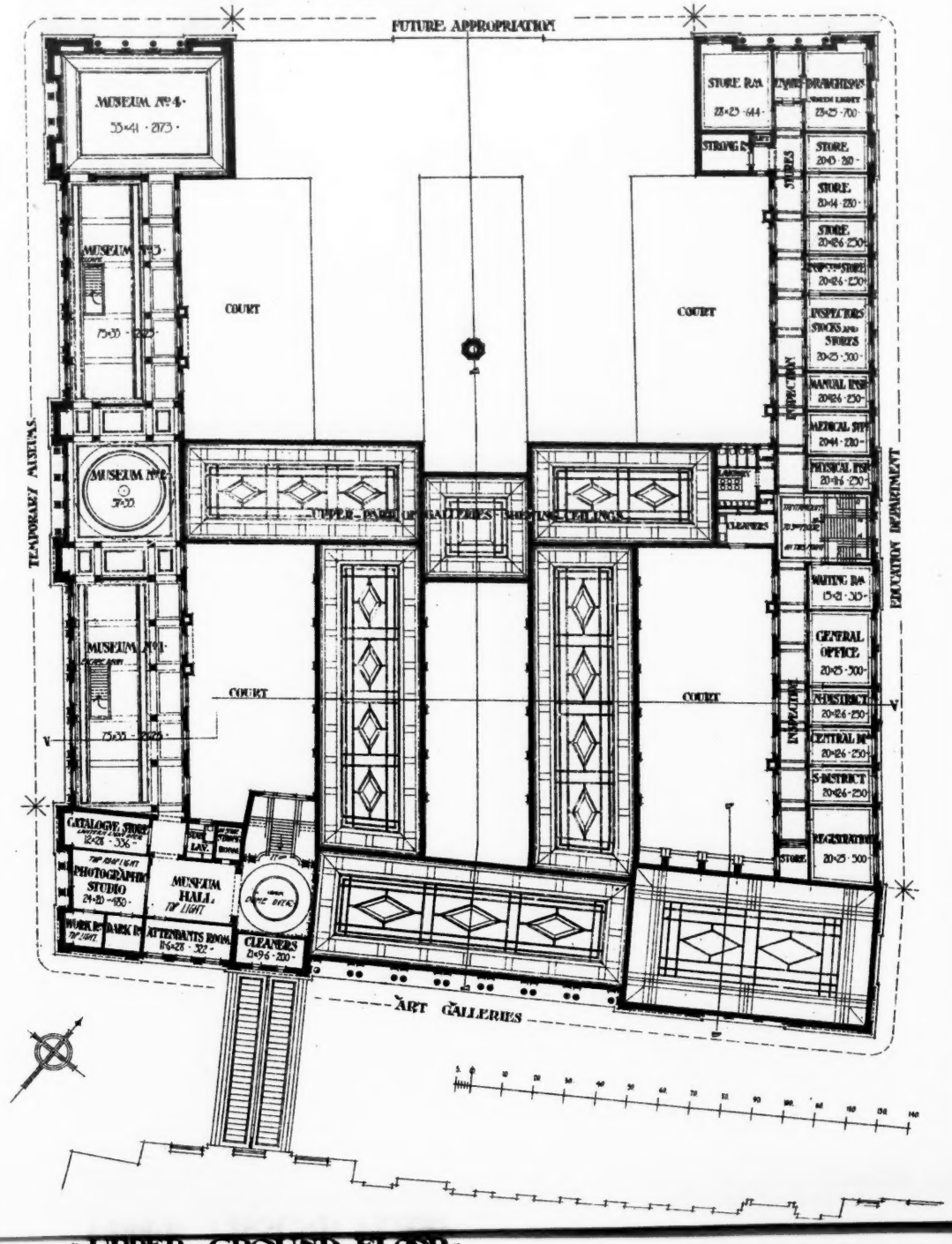
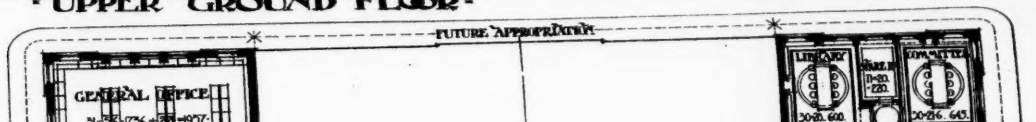


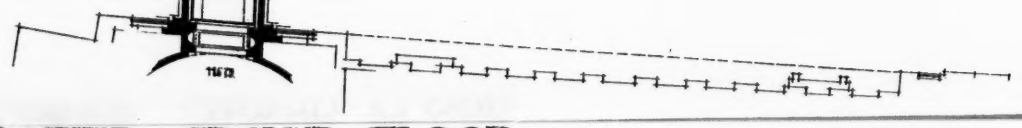
SECOND FLOOR PLAN



LOWER GROUND FLOOR

UPPER GROUND FLOOR





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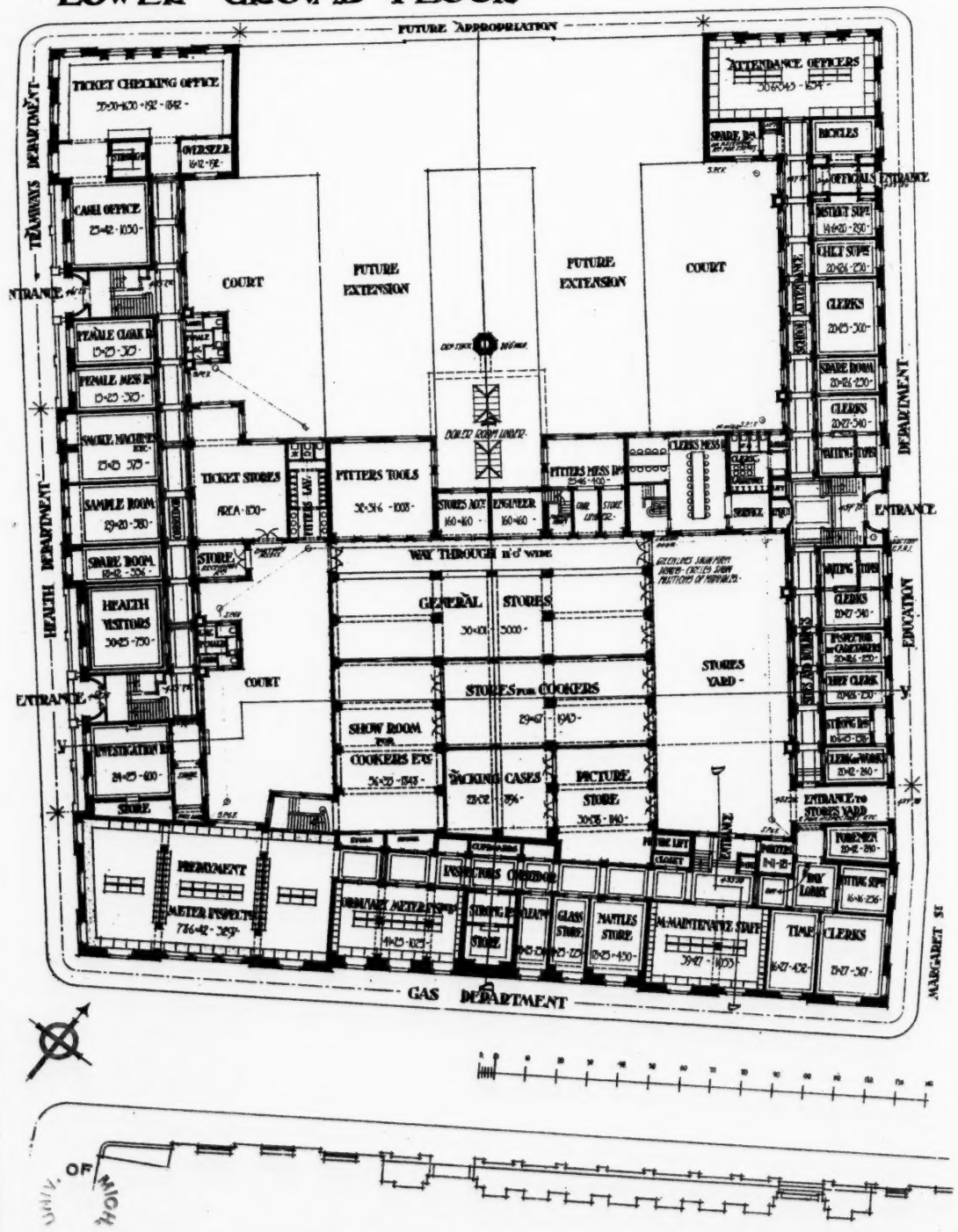

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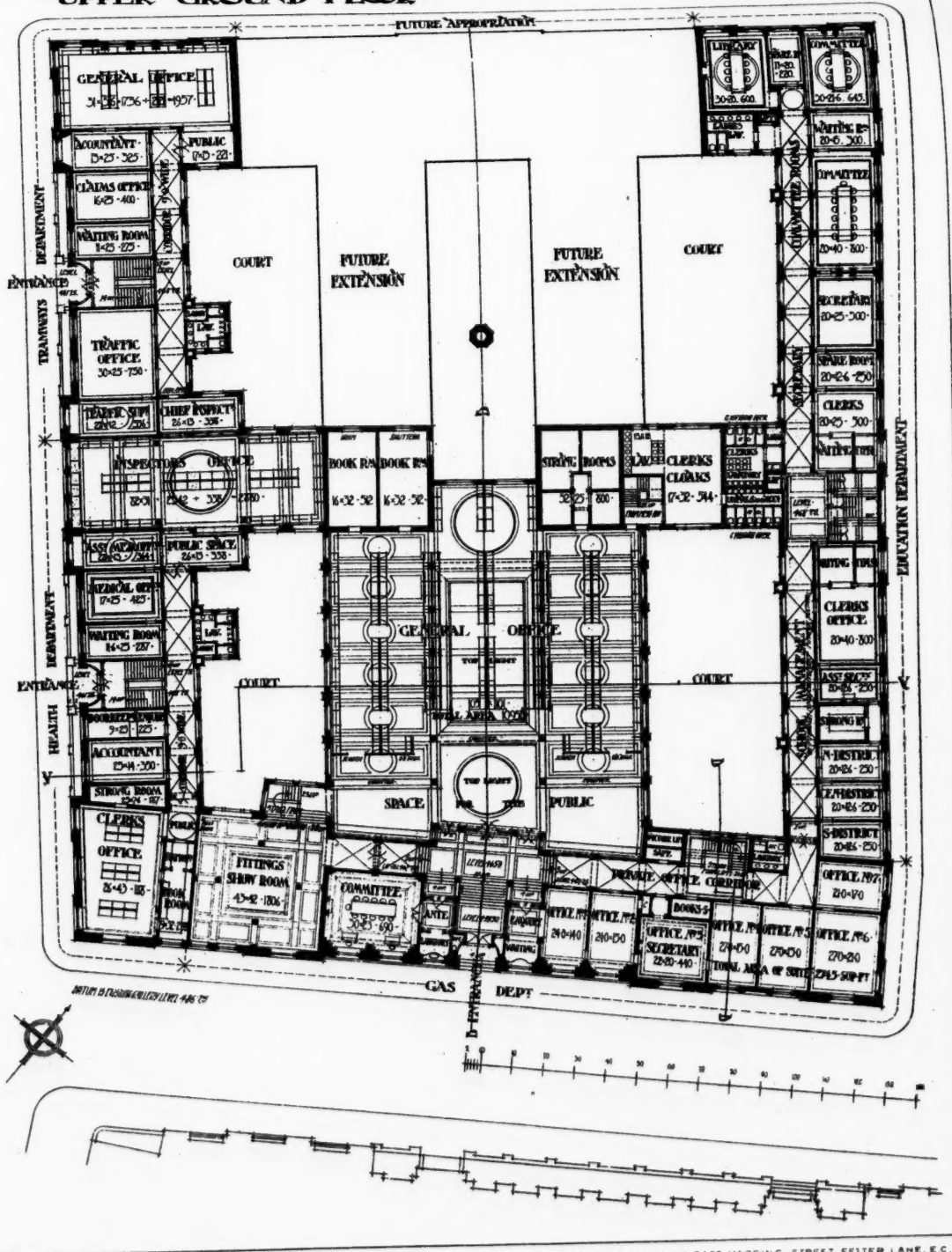

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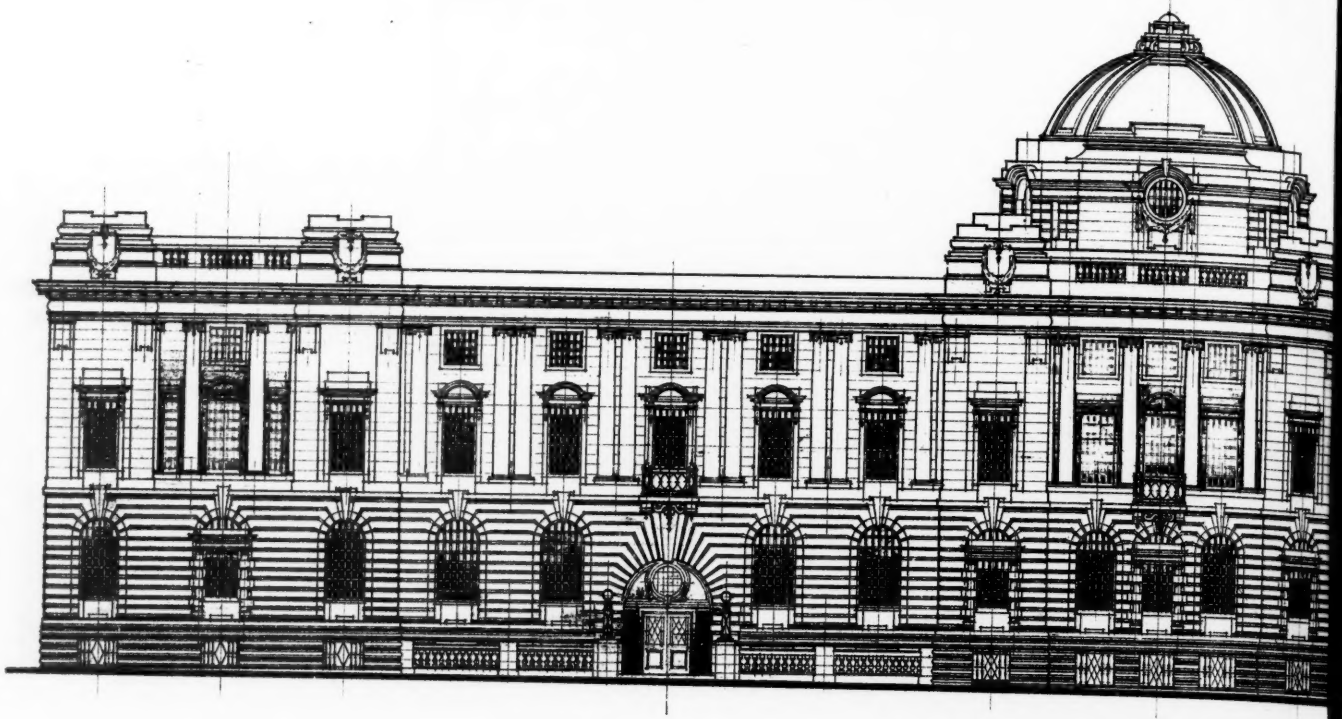

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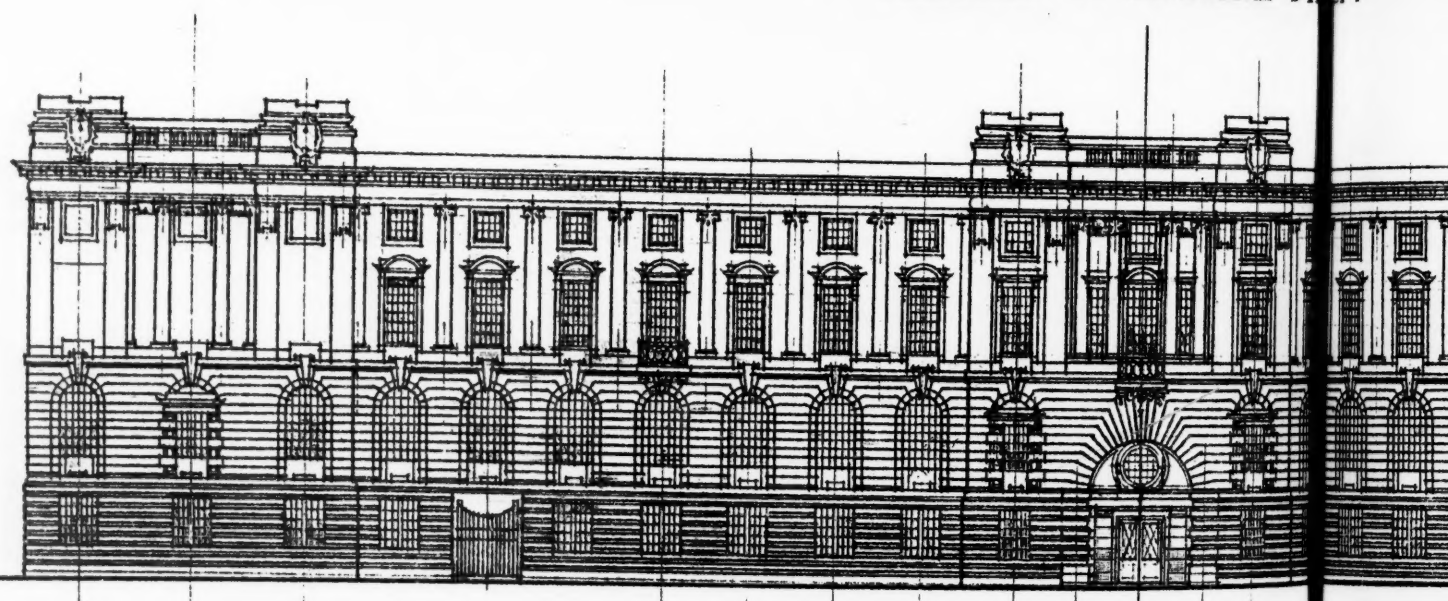

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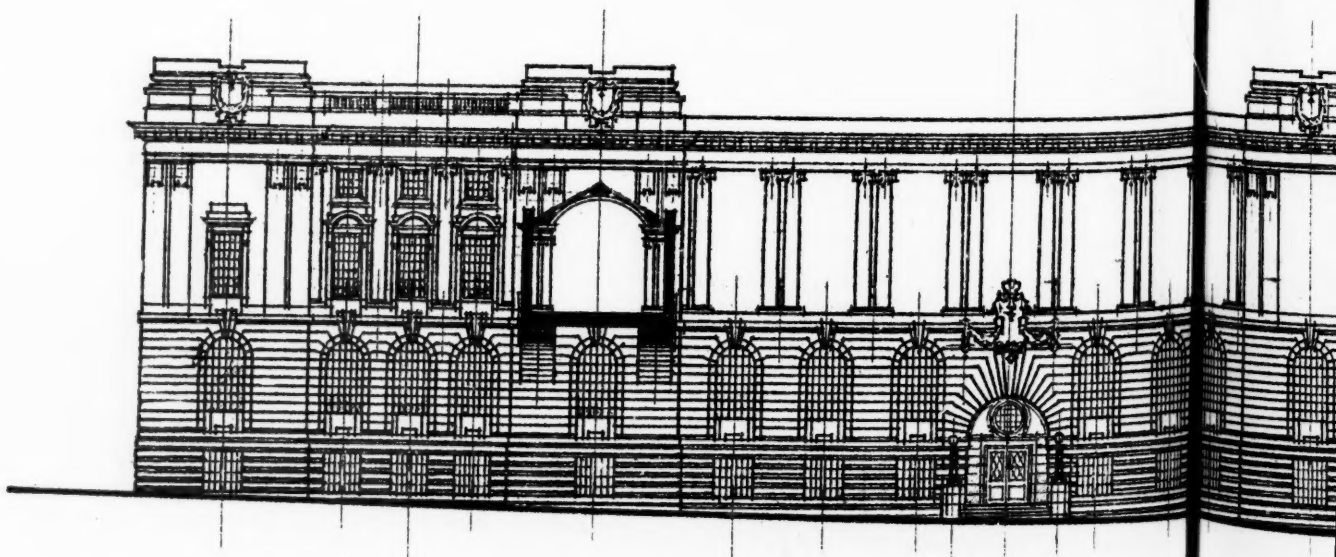

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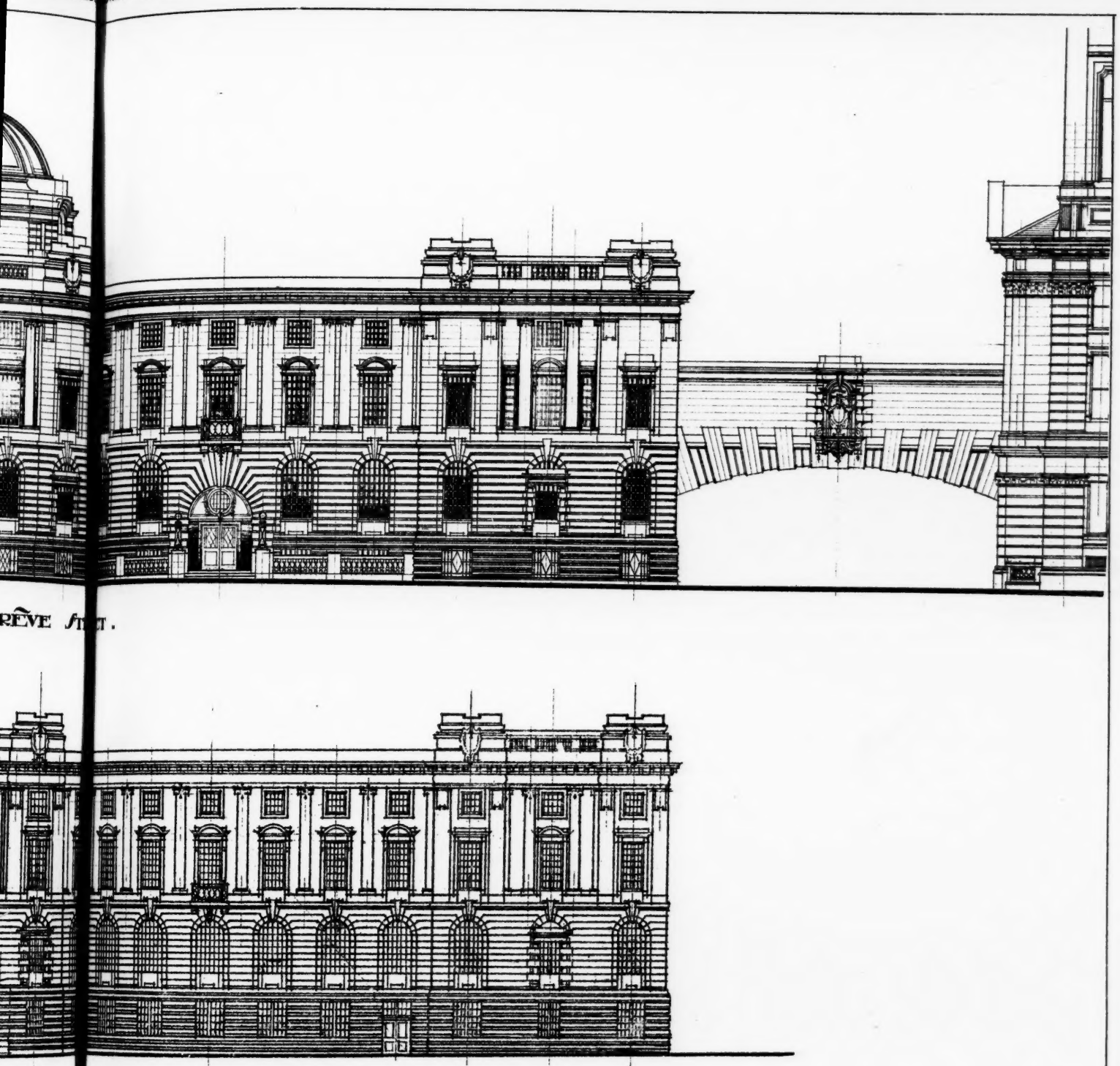

REVE STREET.

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